THE physical therapy REVIEW

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The Role of a Matron in an Orthopedic School — MITCHELL

Head, Neck and Shoulder Tension — JOHNSON

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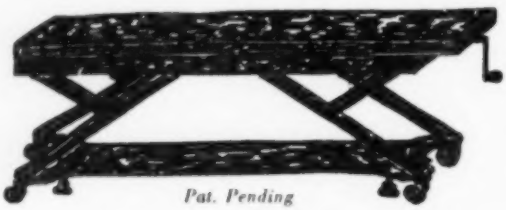

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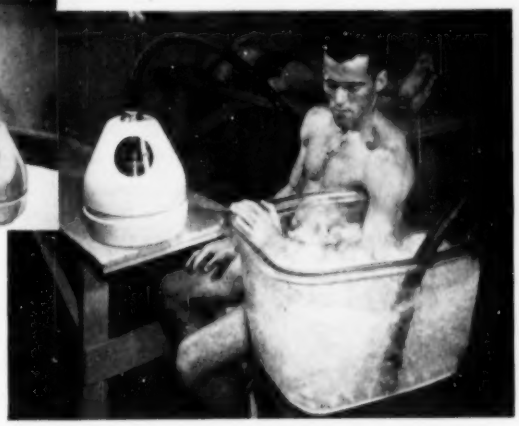

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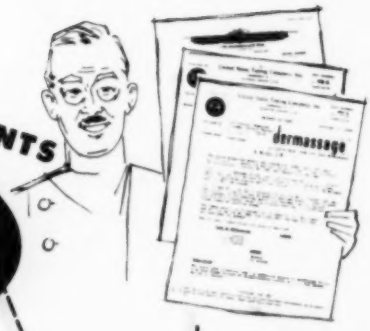

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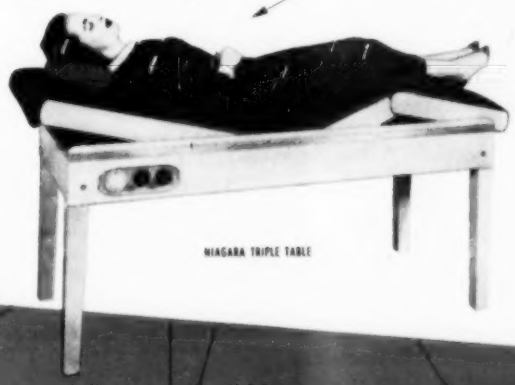

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Vol. 33 **August 1953** **Number 8**

Head Posture and Muscle Tone

Clinical Observations by A. Simons*

Abstracted by Signe Brunnstrom

Consultant, Kessler Institute for Rehabilitation, West Orange, New Jersey; Consultant, Veterans' Administration.

*From the First Medical Clinic of the University of Berlin.

†Tone as used in this article designates an involuntary tension in skeletal muscle.

Introduction

The principles which govern the appearance of tonic neck and labyrinthine reflexes in decerebrate and in intact animals were discovered and reported by Magnus and de Kleijn. An abstract of chapter III of Magnus' book "Körperstellung" appeared in the *Physical Therapy Review*, June 1953.

Observations of the appearance of these reflexes in human beings have been reported in medical literature. Such observations were made on patients with brain lesions which were so severe that practically all cerebral influences were blocked, thus eliminating voluntary control. The patients' conditions, therefore, were very much like that of a decerebrate animal. It was assumed that a severe lesion was necessary in order that "no voluntary impulses disturb the observations" (Magnus). In these severe lesions the reflexes were elicited by passive head motions.

Clinical observations by A. Simons made it clear that extensive brain damage is not a prerequisite for the appearance of neck and labyrinthine reflexes. They can be observed in hemiplegics, although in these cases the reflexes do not appear readily on passive motions. Mild changes in the muscle tone of the affected extremities are likely to occur on passive motions, but cannot always be clearly demonstrated, and a reinforcement of the reflex is needed. Simons reinforced the reflex by having the patient actively contract muscles in other parts of the body. Usually he had the patient squeeze a dynamometer in the unaffected hand, but resisted hip or elbow motions of the unaffected side also were utilized, and sometimes resisted motions of the affected leg to reinforce the reflex in the arm. By this method involuntary motions, called "associated motions," appeared in the affected extremities. It was then demonstrated that the position of the head determined the pattern of the "associated motions," in accordance with the rules for tonic neck and labyrinthine reflexes.

The material contained in the abstract which follows was published, in part, in Zentralbl. f. Neurol. 39:132, 1920, under the title, "Kopfhaltung und Muskeltonus." During the years which followed, the author's observations continued and more clinical data were collected. The article was revised, enlarged, and republished in 1923 under the same title. The following abstract was made from this latter article. (Zeitschr. f. d. ges. Neurol. u. Psycho. 30: 499-549, 1923)

S. Brunnstrom

Study of the influences of the position of the head on the tone† of the extremities is compara-

tively simple in decerebrate animals. In human beings, it becomes more complicated, because a true state of decerebration seldom exists.

It has been known for some time that in hemiplegics strong contractions of muscles of the unaffected side, such as occurs when the patient clenches his fist or when resistive hip flexion is given, causes associated motions to appear on the hemiplegic side. It was by chance, however, that it was discovered that the position of the head determines the patterns of the associated motions.

The influence of the position of the head on the associated motions was first observed in 1916. The patient had a left hemiplegia from a gunshot injury to the head two months previously. The initial flaccid paralysis of the left limbs was receding, particularly in the leg. The distribution of paralysis showed nothing unusual, nor did the skin and tendon reflexes, and the spasticity was mild. Active motions of the left arm were limited to a small range of abduction at the shoulder, and weak flexion at the elbow. Resisted leg raising caused associated motions to appear, and these always followed a typical pattern; namely strong and fairly rapid adduction and internal rotation of the arm, extension of the elbow, pronation of the forearm, mild dorsiflexion of the wrist, and flexion of the fingers.

One day while the strength in the patient's legs was being tested, a nurse placed a glass of milk on the table on the right side of the bed. The patient turned his head rapidly to the right, and as he did so, associated motions of the left arm were observed, but this time the pattern was not the usual one. A strong abduction at the shoulder was seen and the forearm flexed to an acute angle. The hand still dorsiflexed and the fingers flexed.

Following this discovery several more tests were made, and the results were always the same. It seemed obvious that the position of the head determined the pattern of the associated motions. One head position caused adduction at the shoulder and extension at the elbow, the other head position brought about the opposite, that is, shoulder abduction and elbow flexion. These motions appeared involuntarily in the affected extremity when there was voluntary contraction of muscles in another part of the body.

Associated motions of the hemiplegic leg were then studied. At the beginning of the experiment, both legs rested flat on the table. Strong voluntary stimulation of the unaffected side, such as the patient clenching the fist or performing hip flexion against resistance, was used. It was found that, in this patient, the associated motions of the affected leg, in contrast to those of the affected arm, were always the same, regardless of whether the head was held in a neutral position or turned to either side. Each time the patient made a fist, the affected leg flexed at hip and knee; the foot which was originally held in mild dorsiflexion by the extensor hallucis longus showed adduction and inversion as a result of increased tension in the anterior tibialis; an increase in the tone of the knee flexors and calf muscles was also observed. The speed and the range of the associated motions, as well as the amount of tension which was observed in muscles supplied by the facial nerve, seemed to depend upon the strength of the voluntary innervation.

If passive or active head motions were performed without any strong voluntary contraction of muscles of another part of the body, no associated motions of the affected arm or leg resulted, and no change in tone could be discovered. As far as could be determined by palpation and observation, resisted head motions were also without effect. Painful stimuli of the arm or the sole of the foot of the affected side caused a vigorous flexion reflex in all joints, regardless of the position of the head.

All the experiments seemed to indicate that the position of the head had an influence on the tone of the muscles of the hemiplegic arm only when associated motions were elicited by active contractions of muscles of one of the unaffected limbs or the affected leg. Two different patterns were distinguished and these occurred with remarkable regularity; *extension-adduction pattern* appeared when the head was in a neutral position or turned toward the affected side; *flexion-abduction pattern* developed when the head was turned toward the unaffected side.

The study of the interrelationship between head posture and tone in the muscles of the extremities during associated motions was continued for many years. The original observations were made on 31 patients with hemiplegia, all war casualties, between 1916 and 1918. The observations were then continued on a large number of other patients, children and adults, displaying a variety of neurological conditions, such as brain injuries, apoplexy, cerebral palsy, idiocy, spinal cord lesions, and paralysis agitans. Adult patients with hemiplegia, whether caused by trauma, tumors, or cerebral vascular accidents, and children with cerebral palsy (cerebrale Kinderlachmung) proved the best subjects for this investigation.

A standard procedure was followed in examining the patients. First, a general physical exami-

nation was given. The next step was to investigate whether or not the patients exhibited any associated motions accompanying voluntary muscular contractions. Such associated motions, for unknown reasons, are absent, temporarily or permanently, in a considerable number of hemiplegics. In the older age group (60 to 80 years of age) they are seen more rarely, and, if present, motions have less amplitude. A strong voluntary contraction is usually needed to elicit associated motions. In exceptional cases stimulation from a very small area suffices. In one patient with hemiplegia the closing of the eyelid on the sound side caused vivid associated motions of the affected arm. In another case, even an imaginary clenching of the fist brought results.

As a rule, clenching of the fist on the sound side is a convenient method to use and, if no disturbing influences of a physical or psychological nature are present, associated motions are likely to appear. If clenching of the fist does not bring results, the stimulus is reinforced by resisting flexion of the unaffected leg, or by clenching of the jaws, or by contraction of the abdominal muscles. It seems immaterial in which part of the body the muscles are contracting providing the patient makes a maximum effort. If there is marked weakness of the affected leg, stimulation of the sound side should be used. In a few exceptional cases it was found that voluntary innervation of the hemiplegic leg caused marked associated motions of the hemiplegic arm, while even the strongest innervation of the sound side remained without effect.

The patient, when examined, should be rested, not upset, and the observations should be carried out in a comfortably warm room. Cold increases the spasticity, and, if the spasticity is marked, it may interfere with the associated motions. It was observed that in patients who were tired, or who had just been climbing stairs, the influence of the position of the head on the associated motions of the affected limbs could not be observed or was very weak.

The patients were examined, first in the backlying, then in the sitting position, and finally, standing and walking.

Observations in the backlying position

The surface on which the patient lies should be firm and smooth. A table is better for the examination than a bed. The associated motions are investigated with the head in various positions, namely, head in neutral position, turned to the left, turned to the right, tilted to the left (left ear approaches left shoulder), tilted to the right, and finally, with the head ventriflexed and dorsiflexed. In those head postures which cause a definite change in tone, repeated tests are given, both on the same and on successive days.

A standard procedure must be set up. Two different methods were followed: 1. The limb was placed in the same starting position for each test. 2. The limb was placed in a position opposite to the pattern which was anticipated. This position may also be described as the end result of the motion which took place when the opposite head position was used.

To illustrate the latter method, in a left hemiplegic, when the head is turned to the right, a flexion-abduction pattern in the left arm would be anticipated. Therefore, in the starting position, the elbow is extended and the arm adducted. Vice versa, when the head is turned to the left, an extension-adduction pattern is anticipated in the left arm, and the left arm is placed in abduction-flexion before the associated motions are elicited. Thus, it can be stated that the starting position of the limb for one head position is the finishing position of the limb for the opposite head position.

The advantage of using the latter method lies in the fact that a change in tone is more obvious when the muscles innervated are allowed to carry the limb through a wide range of motion. For instance, if the arm is already adducted and extended when an adduction-extension pattern is elicited, the motion may not be perceptible. On the other hand, if the arm is abducted 45 degrees and the elbow is flexed to 90 degrees, an increase in extension-adduction tone causes the arm to move a considerable distance. In the first instance, an increase in tone can be discovered only by noticing the increase in resistance to passive motion in the opposite direction, or, if the patient does not have much adipose tissue, by observing the bulging of the muscles. As a rule, it is wise to choose a starting position which allows the limb to travel through a wide arc of movement.

Such choice of position utilizes von Uexküll's law which states that nervous centers of muscles respond more readily to stimulation if the muscles are elongated. This rule was discovered in animal experiments but it may apply to human beings as well. The possibility also exists that through proper positioning corticifugal impulses in cerebral lesions are either facilitated or inhibited. The tone which is imposed upon the limb from the brain may become more marked when the spinal cord, through proprioceptive impulses, is "tuned" in the same direction.

An impressive experiment, although hard on the patient, is the following one: The patient is

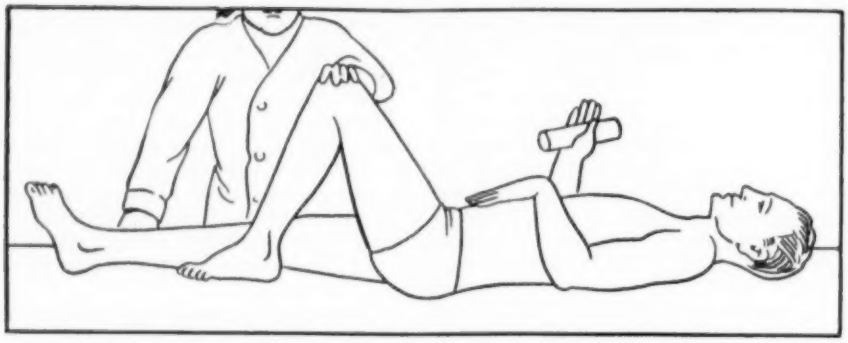

Figure 1 (Redrawn from Plate 1:1). Left hemiplegia from gunshot injury to the head. The right hand grasps lightly an "elastic metal tube." The left leg is passively placed in the flexed position by the examiner in order to make extensor tone more obvious by allowing the leg to move through a wide range of motion. The examiner supports the leg lightly to prevent it from falling outwardly until the associated motion begins. This is the starting position used for the experiments illustrated in Figures 2 to 5.

made to change the position of the head from one side to the other against resistance while simultaneously clenching the fist on the unaffected side. In some patients, the affected limbs exhibit the typical motion associated with each head position, as though the strings of a puppet were being pulled. Flexion at the elbow and abduction at the shoulder are followed by extension at the elbow and adduction at the shoulder. At the knee and hip joints, similar changes between flexion and extension patterns may be seen. The motions stop when the head movements are interrupted and clenching the fist ceases.

The backlying position, in general, is well suited for observing associated motions, since the action of gravity on the limbs is less marked than in sitting and standing. In this position the effect on the abdominal muscles and on the testicles can also be observed. However, dorsiflexion of the head over the edge of the table may cause dizziness and resistance to the motion and may cause unpleasant congestion of blood in the head. The discomfort is lessened if the patient is supported as in figures 4 and 5. In older hemiplegics the head bending motions should be tested in the sitting position or with the patient lying on his healthy side.

In cases of recent head injuries where motions of the head are contraindicated, the trunk should be moved in relation to the head instead of vice versa as the results are about the same.

Observations in the sitting position

The patient sits on the bed or table in such a manner that the feet do not touch the floor. Observations of motions of the spine and the shoulder girdle are made from the back. Small changes in the angle of the knee and the hip are best observed from the side.

Observations in standing and walking

The position of the head, no doubt, influences the tone of the extremities both in standing and in walking, but it is clinically difficult to get a clear picture because of the very complicated muscle activity necessary for maintaining balance and for locomotion. Hemiplegics tend to hold the head rigidly when walking. Possibly, subconsciously, patients keep the head in the position which causes the least amount of interference. It was observed that a hemiplegic, who was standing erect without using a cane and who suddenly turned his head to the side, lost his balance because the flexion tone of the affected leg increased and the patient could not adjust rapidly enough. Several hemiplegics volunteered to say, without being questioned, that walking was more difficult with the head in one position than in another. If, with the head in the difficult position, the patient was asked to clench his fist while walking, the gait disturbance became much more obvious.

Children are well suited for observation because they usually display marked associated motions and these are relatively easy to elicit, provided the child cooperates in giving the voluntary innervation correctly. Children with poor mentality and idiots cannot be used for testing.

Changes in tone caused by various head positions are not always marked enough to cause movement. It is not to be expected that a hemiplegic arm which lies in extension-adduction will necessarily be abducted as much as 90 degrees

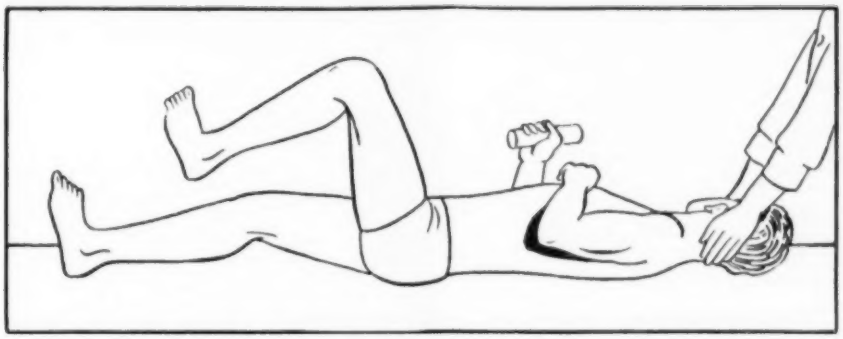

Figure 2 (Redrawn from Plate 1:2). The head has been turned to the right. Associated motions are elicited by having patient squeeze the metal tube with maximum effort. The arm leaves its position of rest, as seen on Figure 1, is abducted at the shoulder, the elbow flexes to an acute angle, the hand dorsiflexes and the fingers close. The flexion tone of the arm is marked, and simultaneously an increased tension in the triceps is observed. In the leg, a strong flexion at the knee and at the hip is seen, accompanied by a mild internal rotation at the hip. The flexion tone at the knee is extremely strong and cannot be overcome by passive stretching. The foot dorsiflexes and inverts, the toes dorsiflex. Associated motions of the healthy leg also can be seen.

at the shoulder, neither that the elbow will flex to an acute angle. At times, only a motion of a few degrees, or no motion at all, can be observed. In such cases the associated motions may be facilitated by supporting the limb in such a position that the influence of gravity is minimized, and that the previously mentioned initial tension is taken into consideration. If voluntary innervation is weak or if there is much tension both in agonists and antagonists, motion still may not be obtained. Differences in tone may then be discovered by testing resistance to passive motions. Since the tone increases in proportion to the intensity of the voluntary stimulation, it is best to make all observations while the patient is making a maximal effort as, for example, by squeezing the dynamometer as hard as he can.

Examinations must be repeated a number of times and on different days. If an identical change of tone is observed repeatedly, testing conditions being the same, conclusions may be drawn.

Motion pictures are useful, but do not replace direct observations. Because of the strong light used in taking motion pictures, bulging of the muscles indicating tension often cannot be observed. In many patients excitement of any kind, such as caused by the preparations for motion pictures or the strong light used, influences or abolishes the otherwise regularly appearing patterns. In order to see all the details of a motion it would be necessary to use high speed photography (300 to 500 frames per second).

Figures 1 to 5 are enlargements of frames of motion pictures taken at 16 frames per second. The patient has a severe hemiplegia of the left side resulting from a gunshot injury to the head. Frames showing the typical influence of the position of the head on the tone of the extremities have been chosen. Additional interesting details can be seen on other frames. In order for these details to show on stills, 30 to 40 successive frames would have to be reproduced. The cultural division of the UFA will, upon request, make the film available.[1]

Motion pictures of this patient were also taken from above, and all pictures confirm the following clinical observations: When flexion tone of the affected limbs prevails, the adductors and internal rotators of the hip and the shoulder on the hemiplegic side are relaxed, that is, the thigh and the arm can easily be abducted and externally rotated by the examiner. On the other hand, when extension tone prevails, the adductors are strongly innervated. Passive abduction at this time is not possible. Similarly, the knee offers the strongest resistance to flexion while the extension pattern prevails, and vice versa.

When a voluntary contraction of the healthy part is used to elicit associated motions one should not draw the conclusion indiscriminately that the position of the head is responsible for the change in tone observed. First, a multitude of variations in tone may and often do appear, which cannot be fully explained by the clinical picture or the general condition of the patient. Second, variations in latency must be taken into consideration. Some-

[1] This article was published in 1923. Whether or not the film is still available is not known.

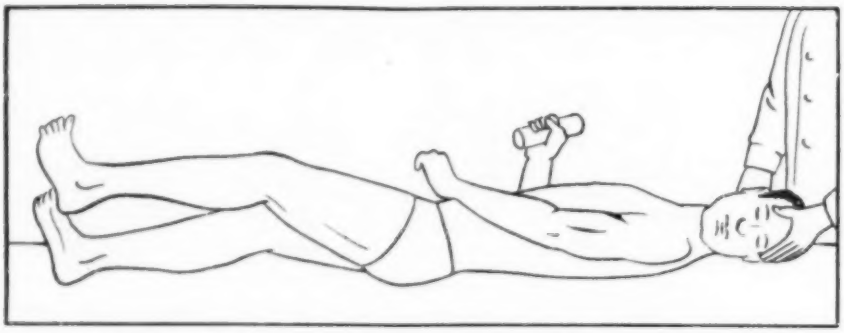

Figure 3 (Redraun from Plate I:3). The head has been turned to the left. The muscles supplied by the facial nerve have become tense, the arm has been adducted and internally rotated, the hand is dorsiflexed and the fingers closed. The wrist has arrived in the neighborhood of the symphysis ossis pubis. An increased tension is observed also in the biceps.

times the associated motions occur simultaneously with the innervation of the healthy side, sometimes several seconds later. The latency is usually short, but may vary in the same patient from one examination to the other, and may be different in the arm and the leg. Facial tension may be observed before or after or simultaneously with the tension in the limbs.

The extent of inhibition of tone in antagonistic muscles during associated motions varies considerably in individual cases, both in regard to degree and timing. A pure reciprocal innervation is rarely seen. In the case of the biceps and triceps, the variations in tone of agonists and antagonists were demonstrated graphically by recording action currents from these muscles. On some days, the diagrams showed a typical action current in the agonists and simultaneously a complete inhibition of the antagonists. At other times, and under the same external circumstances, and without any clinical change having taken place, agonists and antagonists contracted simultaneously showing action currents of equal frequency.

Several patients, for no apparent reason, showed a step by step innervation. A young woman with a right hemiplegia, who was examined in the backlying position, consistently gave the following picture; a raising of the upper arm off the table (the arm was abducted to 90 degrees in the starting position), then an adduction of the arm across the chest, then flexion of the forearm, and, finally, strong pronation of the forearm.

Paradoxical contractions also occur. In some patients, during voluntary flexion of the affected arm, the brachioradialis can be seen contracting. Yet, during an associated flexion pattern the biceps alone is active and the brachioradialis increases its tone during reflex extension.

If the innervation of the healthy side is of some duration, the end position obtained from the associated motion is often maintained by tonic contraction for several seconds after the cessation of the stimulation. Residual tone ("Nachtonus") may be seen in all or in some muscles, and these muscles do not always yield their tone simultaneously. Often the residual tone diminishes very slowly. On repeated passive stretching the residual tone disappears. Complete return to the original tonic condition must be awaited before the next test is given, otherwise the influence of the position of the head may be overshadowed or prevented. As a rule, associated motions disappear when the voluntary effort ceases. The tension of the affected limb is maintained momentarily and then disappears slowly.

In hemiplegics who have some voluntary return in the arm, it can be observed that the patient is always able to overcome actively the extension tone in the elbow brought about by an associated motion, but the reverse does not always hold true. Many hemiplegics do not succeed in voluntarily extending the elbow against a reflex flexion tone. In these cases, if the triceps is tested under more favorable conditions, its voluntary contraction may appear, clinically, as strong as that of the elbow flexors. The inability to extend the elbow against reflex flexion tone, apparently does not depend upon the absolute strength of the muscle. The phenomenon, no doubt, is of central origin.

An interesting pattern, occasionally encountered, was the appearance of reciprocal motions ("Tretrhythmus"): resisted flexion of the healthy elbow caused extension of the affected elbow, and,

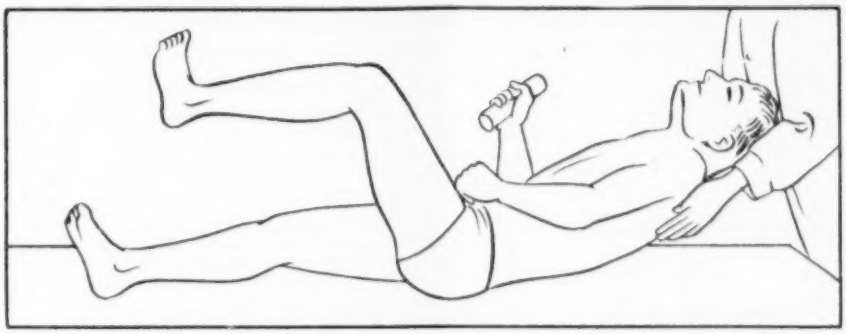

Figure 4 (Redrawn from Plate I:4). A backward bending of the head causes flexion tone in the limbs, similar to the one described under Figure 2.

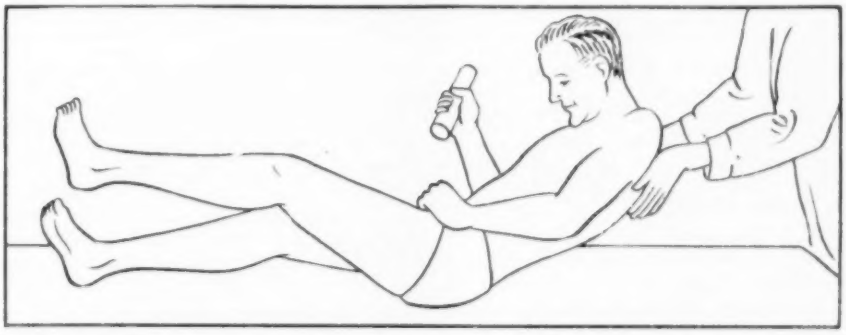

Figure 5 (Redrawn from Plate I:5). A forward bending of the head causes extension tone in the limbs, as described under Figure 3.

vice versa, resisted extension of the healthy elbow brought about flexion of the affected one. In another case a "reversed twitching" (Reuckschlagszuckung") was seen, i.e., during the course of an associated motion, isolated contractions of muscles causing an opposite motion occurred, and sometimes this motion repeated itself to form a back and forth motion, a "rhythmic reflex." The shoulder, the elbow, the hip and the knee, but not the distal joints of the limbs, participated in this motion. A clonic contraction appeared fairly frequently. When through frequent repetitions fatigue of the associated motions sets in the tone may reverse itself, become weaker, or disappear.

The hemiplegic associated motions most often appear as flexion patterns. With the head in a neutral position flexion-abduction pattern occurs more often than extension-adduction pattern. Head bending backward usually elicits flexion. Forward bending of the head sometimes causes a momentary mild flexion before the extension pattern establishes itself.

With exception of irregularities such as those mentioned the influence of the position of the head on associated motions may be summarized as follows: When the state of tone in the hemiplegic limb changes, this change appears either as an increase in the already existing tone or as a reversal of the tone. In the former case, the joint angle may change in the direction of the already existing tone or there may be no change in the angle, but the resistance which the limb offers to passive motion is more in one head position than in the other. For example, one patient showed a strong extension tone in the horizontally positioned leg, regardless of whether the head was turned to the right or the left, but one head position offered much more resistance to passive knee flexion than the other. In the latter case, joint motion usually occurs, unless, as has been stated before, the limb is in an unfavorable starting position. For example, an arm which displays predominantly flexion tone

TABLE A

THE INFLUENCE OF HEAD POSITIONS ON THE TONE OF THE AFFECTED AREAS

Head Position	*Influence on Affected Side*
I. Head turned toward the healthy side:	Increase in *flexion* tone at the elbow, *abduction* tone at the shoulder; almost invariably *dorsiflexion* of the hand, usually equally strong but sometimes weaker than when the head is turned toward the affected side; increase in *flexion* tone at hip and knee, dorsiflexion and inversion of the foot.
II. Head turned toward the affected side:	Increase in *extension* tone at the elbow, *adduction* tone at the shoulder, often accompanied by internal rotation of the arm. Almost invariably, *dorsiflexion* of the hand, usually equally strong but sometimes stronger than when the head is turned toward the healthy side. Increase in *extension* tone at knee and hip, often combined with internal rotation. Equally strong dorsiflexion and inversion of the foot, occasionally plantarflexion of the foot.
III. Head forward bent:	Increase in *extension* and *adduction* tone in the same joints is more common than the opposite.
IV. Head backward bent:	Increase in *flexion-abduction* tone is more common than the opposite.

(abduction at shoulder, flexion at elbow), is seen to adduct and extend.

By analyzing data obtained from 248 hemiplegics (over 1000 examinations) Table A was set up, giving the characteristics of the most common clinical type.[2] Many variations occurred. For example, a pronation of the forearm which sometimes occurs with elbow flexion—supination is the rule—is not mentioned in the table, neither is an ulnar flexion of the hand which occurs frequently because no definite relationship to the head position could be demonstrated.

Changes in tone are more common and usually more marked when the head is turned to the side than when it is bent forward or backward. Tilting the head to the side seemed to have the same effect as turning the head, and therefore, was not tested regularly. Frequently, the arm obeys the rule for the head position while the leg does not, or only mildly so.

A patient who has no voluntary control of the arm becomes startled or surprised when he experiences the influence of head positions on associated motions, and he may express his sensations in terms such as, "It feels as if the arm would be torn away from the body," or, "Now I have the feeling as if the elbow were stiffly braced."

No head position brought about abduction at the hip, eversion of the foot, or fanning of the toes. Influence of the head position on the tone of the muscles of the fingers and the toes could not definitely be determined. One should not conclude, however, that no such influence exists. Since fingers and toes participate in associated motions it is hard to understand why they should not be influenced. An evaluation of the tone of finger and toe muscles is difficult, because, being pluriarticular muscles, their tension is also influenced by wrist and ankle motions. Contractures often further complicate matters.

The appearance of associated motions and the influence of the position of the head on these motions does not seem to be related to the degree of paralysis. The patient shown in figures 1 to 5 who had practically no voluntary motions of the arm exhibited marked associated motions. Another hemiplegic whose arm had almost fully recovered showed very expressive associated motions. The influence of the position of the head was seen in both instances.

It could perhaps be expected that a certain relationship would exist between the influence of the position of the head and other clinical signs of pyramidal lesions, such as heightened reflexes, the number of pathological reflexes present, etc., and that the former might be predicted from the latter. This, however, was never the case. Neither could a change in pathological reflexes be seen when the position of the head was changed. It is noteworthy also that changes in tone of the extremities obtained when the body was moved in relation to the head were identical to those obtained when the head was moved in relation to the body.

The influence of the position of the head on the tone of the trunk muscles, for various reasons, is more difficult to ascertain. It was observed that extension tone of the hemiplegic limbs was accompanied by a marked convexity of the spine toward the healthy side. During flexion patterns the convexity was toward the affected side.

[2] Simons described also another clinical type seen less frequently.

Figure 6

Figure 6 (Redrawn from Plate VI:3). Left hemiplegia from cerebral vascular accident in patient with cardiac deficiency. A forward bending of the head causes adduction of the arm and partial extension and pronation of the forearm.

Figure 7 (Redrawn from Plate VI:4). Same patient as in Figure 6. A backward bending of the head causes abduction of the arm and flexion-supination of the forearm. The associated motions in both pictures are elicited by clenching the tube in the unaffected hand.

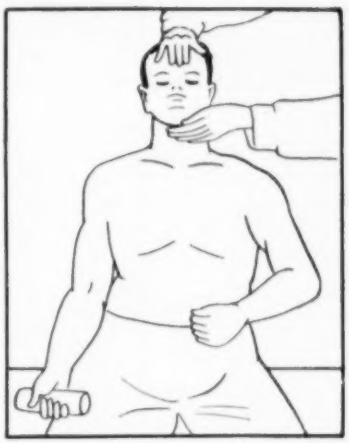

Figure 7

The influence of the position of the head on the abdominal muscles was studied in a young hemiplegic who had suffered a gunshot injury to the neck with involvement of the cord at C5 and C6. A year after the injury, examination revealed that maximum extension tone resulted with the head turned toward the affected left side, and that with this head position a marked contraction of the abdominal muscles on the left side occurred. It was noted also that in this head position the left testicle, which in the relaxed position was lower than the right, rose higher than the right one, another sign that the increase of the tone of the abdominal muscles was more marked on the left than on the right side. (Strong voluntary innervation of the healthy side usually causes a pulling up of both testicles, with the left one, according to its lower physiological position, remaining slightly lower).

In human beings, passive motions of the head rarely affect the tone of the extremities. If they do, an influence is seen only in extreme head positions, while during active, and particularly active resistive motions, the influence often is seen throughout the motion. The latency of the reaction is much greater in passive than in active motions.

Figure 8 (Right leg in cast following surgery)

Figure 8 (Redrawn from Plate II:10). Cerebral palsy in a child. Flexion tone predominated in this child. All voluntary motions were accompanied by flexion of the forearm. Yet, when associated motions were elicited by having child clench the unaffected hand, when the head was bent forward, the arm was adducted and the elbow partially extended. Resistance to passive motions showed that extensor tone increased in the elbow.

Figure 9 (Redrawn from Plate II:11). Same child as in Figure 8. Headbending backward causes abduction of the arm and strong flexion of the forearm. The flexion tone of the forearm was so strong that it could hardly be overcome by passive stretching. The same voluntary contraction as in Figure 8 is used.

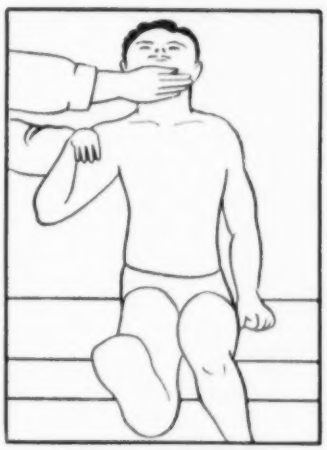

Figure 9

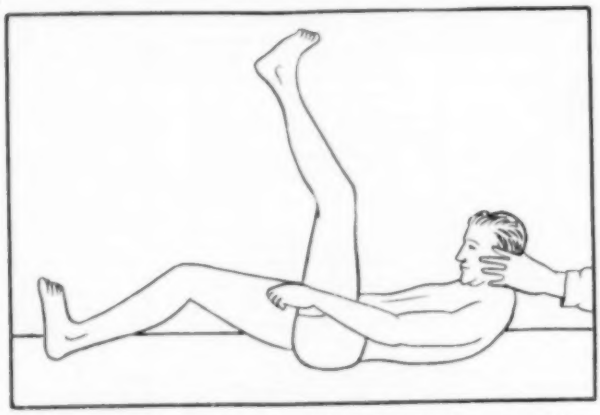

Figure 10 (Redrawn from Plate III:4). Left hemiplegia caused by cerebral vascular accident in patient with cardiac deficiency. Associated motions are elicited by having the patient squeeze a dynamometer in the right hand. Head bending forward causes an extensor pattern to appear in the arm. In the leg, there is a mixed pattern. The knee extends, but the hip flexes. Associated motions in this patient were so easily elicited that even an imaginary clenching of the fist was effective. These motions, however, were less vigorous than when the patient was actually squeezing the dynamometer.

Hemiplegic associated motions are seen only after a certain time has elapsed since the onset of the paralysis. In some cases the influence of the position of the head remains strong and unchanged for an entire year. More often in the late stage, such influence is observed only from time to time or momentarily, although a specific associated pattern may appear regularly no matter what head position is chosen. In the case of one hemiplegic woman, the position of the head determined the pattern of the associated motions except during her menstrual period. Excitement may inhibit the influence of the head position in patients who otherwise have a consistent pattern.

It now remains to explain the influence of the position of the head on the hemiplegic limbs. According to clinical findings, there is no doubt that reflexes of a specific nature are involved. Since these reflexes appear on the hemiplegic side only, it would seem as if they were related to disturbances of the pyramidal system which would free the lower centers from inhibitions from above. This, however, is a nonspecific statement which is commonly used for the explanation of pathological reflexes in general.

Because at the time this article was published (1923) the important investigations on tonic neck and labyrinthine reflexes carried out by Magnus and de Kleijn on decerebrate and on intact animals were not widely known, the author proceeds to give a summary of this research.[3]

In the intact animal, both types of reflexes are interacting, although the strength of their mutual superimposition varies. In some animals and in some experiments, the tonic neck reflexes predominate, in others the labyrinthine reflexes.

In comparing the observations on hemiplegics with the animal experiments of Magnus and de Kleijn, there seems to be no doubt that the reactions of the hemiplegics are manifestations of tonic neck reflexes, more specifically, a predominance of neck reflexes over labyrinthine reflexes.

Several clinical findings indicate that the proprioceptive impulses which bring about the reflexes in hemiplegics do not originate in the labyrinths but rather in the muscles or joints of the neck which are stimulated as the head turns or bends to the side, forward, or backward. It was pointed out earlier that in some patients the trunk was moved in relation to the head instead of vice versa, and that identical results were obtained. Since there was no change in the position of the semicircular canals when the head was stationary, the change in tone observed in the limbs could not be attributed to labyrinthine influences.

A definite parallel may be drawn between the observations on human hemiplegics and decere-

[3] Compare abstract of Chapter III of Magnus' book "Koerperstellung," in the *Physical Therapy Review*, June 1953, Volume 33, No. 6.

brate animal experiments. In the hemiplegic, it is seen that the extensor tone is increased when the head is turned toward the affected side and the flexor tone when it is turned toward the healthy side. This is analogous with the increase in extension tone observed in the "jaw limb" in animals and the decrease in extension tone observed in the "skull limb." The apparent predominance of neck reflexes over labyrinthine reflexes in human beings, however, does not exclude the possibility of an influence of the labyrinths on the tone of the extremities. More clinical research on this subject is needed.

In patients who exhibited signs of extrapyramidal lesions only, neck reflexes were never seen. At least, during six years of clinical observations, no exception to this rule was found. Two cases of spinal cord lesions are reported in which an influence of the position of the head on the tone of the extremities was seen, but neck reflexes in spinal cord lesions, apparently, are rare. In four cases of epilepsy, during the tonic stage of the fit, neck reflexes were seen to act bilaterally on the arms, causing the "jaw limb" to extend and adduct and the "skull limb" to flex and abduct. In two of the cases extension tone prevailed in both lower extremities.

The author proceeds to discuss the probable anatomical site of the centers for the neck reflexes in human beings. He has little to contribute on this subject, but reviews the findings of Magnus and de Kleijn who showed conclusive evidence that in animals the upper cervical segments of the cord are responsible.

A discussion of the effect of the head position on the muscles of the eyes is included, but this part was not abstracted.

The article is illustrated by a large number of photographs. The influence of the position of the head on the associated motions of the limbs is shown on 11 hemiplegics. There are 5 to 15 photographs of each patient, the photographs being arranged on 12 plates. Explanatory text under each photograph is given. The types of patients illustrated are seen below:

Gun shot injury to the head	Plates I, IV, VIII
Cerebral vascular accident	Plates III, V, VI, IX, X and XI
Meningitis	Plate VII
Cerebral palsy	Plate II
Cervical cord injury	Plate XII

These illustrations are instructive, but only a few were redrawn for this abstract. It is recommended that the original publication, available in most medical libraries, be consulted.

REMARKS*

It is evident from this article that one must be cautious not to draw any hasty conclusions when attempting to utilize these reflexes in therapeutic procedures. The reactions in decerebrate animals certainly cannot be applied to human beings without modifications.

From a review of the findings of Magnus and de Kleijn in animals and Simons in human hemiplegics, it appears that human beings and animals display practically identical reactions on head turning, but that head bending forward and backward has the opposite effect in animals that it has in human subjects. In animals, a head bending backward causes an increase in *extensor tone* of the forelimbs, but in human beings, as a rule the *flexion tone* is increased. Vice versa, a head bending forward causes increased flexor tone in animals but increased extensor tone in human beings. This is repeatedly described in Simons' text and it is also obvious in many of the photographs. A reversal of these phenomena is sometimes seen.

A person who wishes to utilize the influence of the position of the head for therapeutic purposes does well to first carefully determine in each patient which position and which type of voluntary contraction are most effective. The experience of the translator of this article has been that associated motions in hemiplegics do not always appear at the first trial, neither can the influence of the position of the head always be seen immediately. As the trials are repeated, both may show up.

It is tempting when observing the effect of body posture and head motions on the associated motions to draw conclusions such as, "This is a typical neck reflex, reinforced by labyrinthine reflexes," or "Now the neck and the labyrinthine reflexes are counteracting each other." Because of the great complexity of these reactions which may be caused by a combination of neck, labyrinthine and other reflexes, or which may be voluntarily as well as involuntarily determined, an explanation of the phenomena observed should not be attempted, or should be made with reservations. Therapeutically, what causes the reactions is less important than the ability to utilize them intelligently. Alertness on the part of the investigator is needed at all times.

*By the abstractor, Signe Brunnstrom.

The Role of a Matron in an Orthopedic School

Lois M. Mitchell

There are twelve orthopedic schools in Wisconsin which serve approximately 1,300 children. These schools function as treatment centers, providing medically prescribed physical therapy for children up to twenty-one years of age. Each school employs one matron or more, who are recognized as valuable nonprofessional assistants in the physical therapy department. The employing agency is the Board of Education of the city in which the school is located. Essential qualifications of a matron are considered to be good health, love for and appreciation of children, ability and willingness to get along with people, and cooperation.

We do not like the term matron and avoid using it except for bookkeeping purposes. Staff members and children address the matron as Mrs. Vincent, Miss Mary, or whatever her name may be, but always using the title Miss or Mrs. A "Mrs. Vincent" or "Miss Mary" is always an important member of the orthopedic school personnel. She is doubly important because of the too-frequent shortages of physical therapists.

Each one of the twelve schools is similar in many respects to the others; however, there are variations relative to the number of children served, plus the physical setup of buildings, housing the schools. The two schools chosen for the purpose of this paper are fairly representative of the remaining ten schools.

The following analysis of duties and responsibilities of the orthopedic school matrons is compiled from a work record kept over a five day period in the two schools. Chart I is a general summary made of the activities of the 1½ matrons employed by "A" School. Chart II is an hourly summary made from the work record of the single matron employed by the "B" School. The composition of these two schools is very similar as are the functions of the respective matrons.

Physical Therapy Consultant, Bureau for Handicapped Children, Department of Public Instruction, Madison, Wisconsin.

Chart I — Activity Analysis

Travel Within Building

Assists children who require such attention

1. Between classroom and physical therapy department.
2. Between classroom and auditorium.
3. Between classroom and special education classes.
4. Between classroom and dining room.
5. Between classroom and handwashing facilities.
6. Between classroom and bathroom.
7. Between dining room and rest room.
8. Between all other destinations where there is any question as to the child's ability to travel alone in safety and comfort.

Bathroom

1. Assists and accompanies all children who require help.
2. Attends those children who require the use of urinals and pans. Cleans urinals and pans.
3. Attends incontinent children who require help in making panty and napkin changes.
4. Provides clean clothing when accidents occur. Washes and dries clothing that becomes soiled from accidents.

Lunch Room

1. Assists with feeding assigned children.
2. Assists with serving children at table.
3. Cleans up any feeding accidents that occur.
4. Washes all feeding bibs used.

"A" ORTHOPEDIC SCHOOL
(city population 52,735)

Total number of children served		76
Enrolled	33	
Outpatient	43	
Maintained in approved and supervised boarding homes for five-day school week		22
Grouping by diagnoses of children served		
Poliomyelitis		30
Cerebral palsy		26
Perthes		4
Feet		3
Cardiac (1 rheumatic fever; 1 cardiac asthmatic; 1 cardiac)		3
Osteogenesis Imperfecta		2
Traumatic		1 (spine)
Spina bifida		1
T. B. Adenitis		1
T. B. hips		1
Hemophiliac		1
Posture		1
Erb's Palsy		1
Encephalitis		1
Orthopedic School Personnel		
Teachers		3
Physical Therapists		2
Matrons		1½
Cook		1 part-time

"B" ORTHOPEDIC SCHOOL
(city population 34,010)

Total number of children served		99
Enrolled	31	
Outpatient	68	
Maintained in approved and supervised boarding homes for the five-day school week		13
Grouping by diagnoses of children served		
Poliomyelitis		36
Cerebral palsy		33
Posture		12
Muscular dystrophy		3
Fracture		2
Clubfoot		2
Cardiac (1 congenital disease; 1 rheumatic heart disease)		2
Amputated leg		1
Hydrocephalus		1
Rheumatoid arthritis		1
Muscle atonia		1
Brachial plexus injury		1
Brachial palsy		1
Meningococcus meningitis		1
T. B. hip		1
Epiphyseal slip, hip		1
Orthopedic School Personnel		
Teachers		2
Physical Therapists		2
Matrons		1
Cook		1 part-time

5. Supervises and assists children in picking up trays and stacking dishes when classrooms are used in lieu of dining rooms.
6. Serves midmorning lunch of milk and crackers except to those who are on diets.

Rest Room

1. Prepares rest room for use by seeing that cots, window shades, etc. are satisfactorily adjusted.
2. Supervises use of blankets.
3. Supervises folding of blankets.
4. Supervises storage of blankets.
5. Supervises management of rest room. Each child has a foot protector, usually made of oilcloth, so that the sheet or canvas does not become soiled from shoes. Each child has his own towel on which to place his head. These details are the responsibility of the matron.
6. Shares rest room supervision with the teachers and the physical therapists.

Hydrotherapy Room

1. Fills, empties, and cleans Hubbard tank.
2. Prepares children for treatment.
3. Assists children in and out of tank at request of physical therapist.
4. Sees that treatment garbs are properly hung and dried.
5. Dries hair of patients before leaving the physical therapy department.
6. Keeps floor of hydro room mopped.

Physical Therapy Department*

1. Assists and prepares children for treatment. Some require help in getting on and off treatment table. Some need help with clothing, braces, etc.
2. Supervises dressing and hand skills.
3. Assists certain children with walking training.
4. Applies and supervises application of sandbags and weights as instructed.

* Note: It is understood that all treatment activities performed or assigned to the matron are under the direct supervision of the physical therapist.

5. Assists physical therapists with stretching exercises by supporting patient while physical therapist does the stretching.
6. Applies, supervises, and removes bakers and lights as instructed (ultraviolet excluded).
7. Assists and supervises children in use of apparatus, bars, bikes, etc.
8. Supervises play therapy.
9. Supervises certain mat activities.

General Housekeeping

1. Dusts the physical therapy department (equipment and toys that are considered to be beyond janitorial duties).
2. Cleans supply and storage cupboards.
3. Makes sandbag covers.
4. Makes pads and covers for banana carts, special chairs, etc.
5. Does all the physical therapy department mending and sewing.
6. Makes bandages, swabs, etc., as instructed by the public health nurse.
7. Waters the plants.
8. Paints, varnishes, and cleans the physical therapy department equipment and toys.
9. Catalogues and tags donated equipment and materials.
10. Assumes responsibility for outgoing and incoming laundry. Counts, repairs, and stores laundry.
11. Cleans floor mats (therapy mats) weekly.
12. Cleans all washbowls at least twice daily.

Miscellaneous

1. Responds to all buzzer calls from the classroom teachers.
2. Sees that wheel chairs and carts are available for reception of children from school bus. Sees that same vehicles are properly parked when not in use.
3. Answers telephone when free to do so.
4. Makes simple repairs to toys, dolls, and games.
5. Makes simple repairs to crutches, braces, and corsets such as replacing pads and straps to crutches, oils braces, sews tears in leather of braces. Salvages and cleans usable leather and buckles from discarded braces. Replaces tips on shoe and corset lacings.
6. Makes necessary trips to janitors' office, shoemaker, brace repair shop, drug stores, post office, city and county health departments, calls taxis that are not regularly scheduled, accompanies children to dentist and barber shop.
7. Weighs children at stated intervals as instructed by the physical therapist or public health nurse.
8. Assumes directed responsibility for party treats, remembrances to the ill or absent.
9. Assumes various responsibilities on orthopedic school clinic days such as distribution and collection of all linens used, assists children and parents in dressing rooms and responds to other similar duties as they arise.
10. Abides by all building rules, regulations, and agreements as they pertain to fire drills.

CHART II — CHARACTERISTIC DAILY SCHEDULE

8 a.m. to 9 a.m.

1. Reports to work. Changes from street clothes to white cotton uniform and flat white shoes.
2. Makes necessary preparation to meet those children who arrive at school in taxis or buses. This consists of placing the chairs and carts in the elevator that would be needed for children in the respective vehicles. Takes elevator from first floor to taxi entrance on ground floor. Driver assists children to waiting elevator and worker takes first taxi load of children to first floor. This is repeated until all vehicles are met and all children are accounted for.
3. Assists those children who require help in removing snowsuits, outer wraps, boots, etc.
4. Accompanies children to the bathroom and thence to their classrooms.
5. Prepares two children for table treatment.
6. Applies Tony's braces. Tony is a cerebral palsied child who intermittently wears a head control brace throughout the school day.
7. Sews button on Jack's coat.

9 a.m. to 10 a.m.

1. Sterilizes plastic drinking straws in kitchen.
2. Loads serving cart with milk and crackers for midmorning lunch.

3. Distributes milk lunch to the respective classrooms.
4. Helps Dan (athetoid) with his milk lunch.
5. Helps Joy (cerebral palsy) with her milk lunch.
6. Assists Dan to bathroom, helps him wash his hands and then accompanies him to physical therapy department for treatment.
7. Helps two children prepare for treatment.
8. Assists Tony (cerebral palsy) to bathroom, helps him wash his hands, and accompanies him to his classroom.
9. Collects milk bottles, places them on serving cart, and returns all to kitchen.
10. Starts filling Hubbard tank.
11. Helps prepare Kate (poliomyelitis) for Hubbard tank.
12. Assists Dan to and from bathroom.
13. Assists Paul (hydrocephalus and occipital meningocele) to and from bathroom.
14. Assists Paul and Dan with outer clothing for recess.
15. Helps Kate from Hubbard tank. Helps her get dressed. Dries her hair. Hangs her swim suit for drying.
16. Delivers supply materials to recreation room.
17. Removes Jim's braces.
18. Prepares warp for setting up of loom.

10 a.m. to 11 a.m.

1. Prepares Anne (hemiparesis, right, post-traumatic) for table treatment and places infra-red light over her.
2. Assists Tony to bathroom and with hand washing.
3. Answers phone. Places phone call.
4. Prepares Tony for Hubbard tank.
5. Assists Dan in use of walking bars.
6. Assists Dan in learning to ride tricycle.
7. Calls taxi for high school outpatient.
8. Takes Marion, a high school outpatient, down on elevator to her waiting taxi.
9. Prepares and serves fresh orange juice to Kate and Mary who are on medically supervised diets.
10. Assists in helping children to the auditorium for a movie.

11 a.m. to 12:10 p.m.

1. Dusts equipment and physical therapy department.
2. Cleans all washbowls.
3. Answers phone.
4. Prepares Mary for Hubbard tank.
5. Assists physical therapist in supervising Dick who is found to have elevated temperature. Dick is isolated in rest room awaiting visit from public health nurse.
6. Cleans mud from Tony's shoes following recess.
7. Provides Tony with hand work materials.
8. Applies Jim's brace.
9. Accompanies Paul from classroom to physical therapy department.
10. Wheels two children down corridor to dining room.
11. Assists in feeding Dan and Tony.

12:10 p.m. to 12:30 p.m.

1. Removes Jim's brace.
2. Supervises rest room.

12:30 p.m. to 1 p.m. — Off Duty.

1 p.m. to 2 p.m.

1. Gets children up from rest period.
2. Assists Dan, Paul, and Tony to bathroom.
3. Puts rest room in order.
4. Assists physical therapist with children engaged in walking training, mat activities, tricycle riding, etc. (30 minutes).
5. Sews "Butch's" shirt — torn at recess.
6. Assists Orlo (poliomyelitis) with dressing following treatment.
7. Assists Jake with dressing following treatment.
8. Supervises Dan, Joy, Paul, and Tony with additional walking activities.
9. Cleans Hubbard tub.
10. Answers phone. Takes message for physical therapist.
11. Plays with 2 year old outpatient on floor mat.
12. Assists Dan and Paul to bathroom.
13. Replenishes daily supplies from janitors' office.
14. Applies Jim's brace.

2 p.m. to 3:25 p.m.

1. Removes paint from Kate's dress.
2. Supervises and entertains two preschool outpatients following treatment and during absence of mothers (15 minutes).
3. Removes more mud from Tony following recess.

4. Replenishes bathroom supplies.
5. Assists Dan, Paul, and Tony to bathroom.
6. Dresses Mary.
7. Removes Jim's brace.
8. Counts and prepares laundry for pick-up.
9. Answers elevator ring.
10. Brushes Tony's teeth.
11. Starts getting first taxi load of children ready for departure, second load, etc.
12. Supervises and attends loading and unloading of elevators.
13. Sees children off in taxis.
14. Cleans washbowls.

3:25 p.m. to 3:30 p.m.

1. Reports departure to physical therapist.

SUMMARY

We have attempted to acquaint you with a general outline of the functions and responsibilities of one who serves as matron in an orthopedic school. In a working situation of this kind the reason why a matron must work "with" you rather than "for" you is obvious. Where growing children are present there will be everlasting handwashing, toileting, food spilling, sympathy seeking and noseblowing. (We add the latter knowing the otologist says noses should never be blown!)

The effectiveness of a matron is largely determined by what she is as an individual. Still, her efficiency may be dependent upon the physical therapist's ability to give directions and to teach. Her acceptance in the school situation is measured by the children's responses to her.

Head, Neck and Shoulder Tension

Edgar W. Johnson, A.B.

Patients with psychosomatic disturbances often complain of pain in various parts of the body. Some of these areas are the heart, the abdomen, the legs, the shoulders, the neck, and the head. The most common site of pain from tension in the body is in the neck and shoulders. Hersh has described how tension in the posterior neck muscles may spread to muscles in various parts of the head to cause tension headaches:

"Headache, regardless of its source, causes a reflex increase in tone in the cervical and temporal muscles. The nuchal ends of the trapezii are involved, then after a lag the temporalis muscles increase their tension and after another relatively long lag the frontalis and occipitalis muscles are involved. When the ache is long continued, the muscles develop spastic nodules which are very tender and are themselves sources of pain. In corroboration of Kellgren's earlier observations it was shown that noxious stimuli applied directly to the cervical muscles produce headache and reflexly cause contraction of the unstimulated muscles. Thus, it was demonstrated that a vicious cycle, whereby headache produces spasm, which in turn becomes painful and produces further headache, could be reproduced experimentally. The occurrence of increased muscle tone and subsequently spasm was also demonstrated in individuals in whom anxiety states were experimentally induced.

"The actual physiology of this type of reaction has been described in detail by Lorente de No's studies and analysis of the activity of chains of internuncial neurons. He stated that prolonged bombardment of pain impulses sets up a vicious circle of reflexes spreading through a pool of many neuron connections upward, downward, and even across the spinal cord. Because of the summation principle of nervous impulses, there is kept alive in such pools a constant circling of activity across the synapses involved. Thus, involvement of the sympathetic motor neurons in the lateral horns, which control vasomotor tone, produces spasm in the arteriole and venule ends of the capillary loops, raises the filtration pressure to cause edema and swelling. Cyanosis and anoxemia increase capillary permeability and filtration, further augmenting edema. Other synapses involved may be the anterior motor horn cells giving rise to skeletal muscle cramp and spasm."

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Those people suffering from tension headaches usually have pain in the posterior neck muscles and in the area of the upper trapezii where it covers the supraspinatus muscle. Complaints of pain from the neck down the back, along the medial edge of the scapula, are not infrequent.

Patients with the ailments mentioned above often have life situations and personality problems which are contributing factors to tension and the development of pain. It should be understood that the physical measures mentioned here should be used only as a part of a program of therapy directed by the physician.

Various physical measures are useful in the treatment of tension in these areas. Among these are heat, massage, posture training, stretching, and instructions for the voluntary relaxation of muscles. Heat and massage are commonly used in the treatment of these disorders. Emphasis in this paper will be placed on the use of stretching exercises, posture exercises, and relaxation.

Stretching, particularly, after heat and massage, is useful in lengthening chronically tightened muscles. The muscles which need stretching most frequently are the sternocleidomastoids, the lateral and posterior neck muscles.

Jacobson has developed the following technic which is exceptionally beneficial in the treatment of these cases. Relaxation and stretching of the posterior neck muscles may be attained at the same time by having the patient sit in a chair, which has no arms, with his arms hanging at the sides. The patient sits as far back in the chair as possible. The head is gradually lowered to the front, as far as it will bend, by loosening the tension in the back of the neck. It is allowed to stay in this position for two, five, fifteen, or more minutes. This not only stretches muscle fibers, allowing a fresh blood supply to enter muscles that have been tense, but also stretches the fascia covering the muscles, which may be shortened in chronic cases. The neck is more comfortable when the head is raised slowly from this position. This technic is repeated daily until the desired result is attained.

Relaxation training is usually carried out when the patient is supine. Instructions are most easily given when the patient is in this position, although face-lying and side-lying positions may be used. In the back-lying position some patients rest better without a pillow due to pressure to the sensitive area of the head and neck. The patient is taught to recognize tension or tightness in the neck muscles and to let the tightness or tension go away—or, to relax. First, the neck should be extended so that the head is pushed against the pillow or bed. The patient should feel tightness in the extensors of the neck in so doing. Palpation of these muscles, while they are contracting, is useful in helping the patient recognize muscular tension. He is then taught to recognize minimal contractions when the neck muscles contract only slightly. After learning to recognize tension, the patient is taught to relax these muscles. Relaxation for the patient is achieved by having him notice the feeling of tightness diminish as he loosens the tension in these muscles. After the patient learns to recognize tension in the muscles, he cultivates relaxation by using any feeling of tightness as a signal to relax. A rest period of 15 to 20 minutes just after lunch or at other suitable times is very important in giving these chronically tense muscles an opportunity to rest. During this rest period the previously mentioned details of relaxation should be carried out. The following instructions are given:

1) Rest in a quiet room. Do not talk with anyone or have the radio on while resting.
2) Loosen constricting articles such as belts, ties, etc.
3) The hands and feet should not touch. (Keep the legs uncrossed. Many people tend to wring their hands, rub their fingers or feet together.)
4) The patient is to acquire the ability, while resting, to make a minimum of movement. Any movement prevents one from resting as well as possible, though one need not be tense in order not to move. It is necessary, when learning to relax, to let oneself go loose like a bag of sand, a rag doll, or a jelly fish. This takes time and practice.

Relaxation of other parts of the body should be learned, as tension is not confined to any one area. Jacobson describes a technic of general body relaxation. After learning to relax the neck in a lying position, one should practice relaxing in sitting and standing positions. In these two latter positions only enough tension should be used to maintain the head in the proper position. Proper neck position while sitting or standing will be described.

Correct posture is of the utmost importance in alleviating neck and head pain. Kuhns has described how an increased forward position of the head may cause pain in the posterior cervical muscles. Besides gaining good general body posture, the neck should be drawn back or the cervical curve flattened by pulling the chin in. The head is not to be tilted back, as this increases the tension of the muscles attached to the nuchal lines of the occipital bone. By "pulling the chin

in" a more even distribution of muscle pull along all of the cervical vertebrae is required. This alleviates much neck pain. Obviously a heavy pull is not desired, for in so doing all of the neck may become rigid. The chin should be "pulled in" only enough to attain good posture. The head should then feel like a ball lightly balanced on the neck.

Stretching exercises, posture exercises, and relaxation technics for pain from tension in the shoulders, neck, and head are technics which may be learned and carried out by the patient. The therapeutic measures mentioned help prevent pain patterns from becoming well established in acute cases and afford relief when they have been long established.

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Physical Therapy and the Adult with Cerebral Palsy:

Report of a Conference on Vocational Guidance

William Brooks, B.S., Mary Callahan, B.S., Jacob Schleichkorn, M.A.

The United Cerebral Palsy Associations and the Department of Special Education, Teachers College, Columbia University, sponsored a case demonstration and work conference on vocational guidance of the adult with cerebral palsy. The purpose of the conference was:

1. To illustrate problems of vocational guidance.
2. To demonstrate how professional groups can aid the adult with cerebral palsy.
3. To illustrate teamwork of all concerned.

The first day of the conference was held at Columbia University on April 24, 1953. Two case histories of adults with cerebral palsy were presented. The cases were then discussed by a selected group of consultants from every profession working with the cerebral palsied. These consultants applied their knowledge and experience to the guidance of the two persons. Following the presentation of the cases and the discussion, the members of the conference were assigned to various rooms to meet with members of their own profession. There a group leader presented questions pertaining to the role which that profession could play in the habilitation of the adult with cerebral palsy. The discussion was followed by a recorder. The purposes of the group meetings were:

1. To define the contribution which each professional group could make to the habilitation of the adult with cerebral palsy.
2. To serve as a clearing house for the exchange of experiences and ideas to be shared later with the conference as a whole.
3. To provide maximum individual participation in the conference.
4. To establish machinery through which the group process could stimulate post-conference action.

Professional groups represented were Medico-Psychiatry, Physical Therapy, Occupational Therapy, Psychology, Vocational Counseling, Agency Administration, Speech Therapy, Social Casework, Placement, Group Work, and Adult Education. The entire proceedings of the conference will be available in the near future from the United Cerebral Palsy Association. This is the report of the Physical Therapy group.

William Brooks, Physical Therapist, Godmothers' League, New York.
Mary Callahan, Director Training Courses Physical Therapy, Columbia University, New York.
Jacob S. Schleichkorn, Richmond County Cerebral Palsy Treatment Center, New York.

The first case presented to the conference was that of a 26 year old male of middle class background. A summary of his physical condition includes general athetosis with facial grimaces, a hand involvement which makes it impossible for him to write but which permits the use of a typewriter, poor gross movements, independence in self care, and normal language development. There is evidence of perceptual distortion and he has an I.Q. of 130 with superior intelligence. He has worked on a chicken farm without salary. He enjoys writing. He is being sent to an institution for a complete evaluation to prepare him vocationally, although he has been evaluated previously with no conclusive results.

After much discussion the physical therapy group concluded that the case history as presented was inadequate. It was also felt that the average adult with cerebral palsy brought to the attention of an agency today, probably has not been exposed to an adequate program of physical therapy prior to adulthood. This has resulted in "shopping around" and inadequate or no counseling in vocational guidance. It also illustrated that progress notes and evaluations for any previous treatment were not complete or integrated. The medical history and records of specific functional achievement in this case also were inadequate. This would tend to mislead guidance personnel just as it limited the physical therapy group in its discussion. It was suggested, therefore, that a complete medical history should be available with *progress to date* clearly indicated so that aims and objectives might be determined. The group, limited by this lack of information, recommended that the young man receive an evaluation of his functional achievements and potentials. It was recommended also that the findings should be presented to the group staff since these will influence his vocational placement.

The second case presented to the conference was that of a 26 year old male, a high school graduate with average credits. His physical problems are as follows: his speech is dysarthric but intelligible to the point where it constitutes only a mild handicap in terms of commercial employment; his hearing is within normal limits; he represents the combined spastic and athetoid type, with athetosis predominating; his gait is effective and he is able to travel under all circumstances, but there is definite unsteadiness while walking. His upper extremities are involved to the extent that his handwriting is slow and poor, though intelligible. Detailed movements requiring meticulous coordination are impossible. Gross movements such as wrapping bundles can be performed well with a slightly less than normal speed. The young man comes from a family in the higher income group. He is married and his wife is a spastic with above average intelligence. Her movements are quite spastic and her speech problem is more serious than her husband's. She has never been able to obtain employment. Her handicap and inability to be productive at a level comparable with her intellectual capacity have been sources of great resentment. The young man has obtained jobs on his own or was placed by an agency. He repeats performances of poor production, absenteeism, and finally loss of employment. It also was stated that he has reached his maximum physical ability.

It was the feeling of the conference participants that the young man's problem was of an emotional origin. The physical therapy group felt that the man's functional level seemed to be good, and agreed that if the emotional problems of the man and his wife are settled, physical therapy with tests for functional ability might be indicated. There was some dissatisfaction among the physical therapists with the conclusion that the maximum physical achievement had been reached. Too often because the person can ambulate, the job is considered finished. It is generally accepted that the physical appearance of a person is often a deciding factor in job placement. It also was stated in the group, that the outlook varied with the patient's progress at different agencies and with the specialists handling the case. There should be a general basic philosophy and acceptance as to the need for training toward adulthood. In the training of young children with cerebral palsy today, this point seems to have been overlooked.

The physical therapists then discussed additional suggestions that could be made to aid in the training of the adult with cerebral palsy. The suggestions were included in the final report.

On the second day of the meeting, April 25, reports of the recorders of the professional interest groups were presented to the entire conference. The body of that report has been included in this paper. The physical therapy group also made the following recommendations:

1. More emphasis should be placed on functional programs for the adult at the treatment center, with a home program to be carried out by the person.

2. Facilities for recreation, camping and socialization should be provided to increase the adult's field of experience and contact.

3. Special evening programs with emphasis on therapies, guidance and group work, should

be established in the facilities that are used only during the day. This would open areas for further treatment and increased use of staff. Such a program has been successfully carried on by the Federation of the Handicapped, New York City. For example, the evening group receiving physical therapy would be made up of disabled persons not able to attend daytime clinics. The facility could be staffed by therapists who find it impossible to work full-time due to home commitments. It was the feeling of the group that the attrition rate of 7% as determined by the American Physical Therapy Association on the basis of membership figures would drop if evening and part-time positions were available.

4. There should be a greater awareness of what physical therapy can contribute to the total habilitation process of the adult with cerebral palsy.

5. Greater efforts must be made to overcome the shortage of trained therapists. This may be brought about by increased publicity to attract personnel, better utilization of inactive therapists, and financial assistance to trainees, in addition to salaries commensurate with training, education and experience.

The general feeling was that the conference was a success and it is hoped that more will follow. It demonstrated that our recognition of our own inadequacies shows that we are making headway. It was clear there are problems in our own disciplines which must be solved. The value of early treatment was stressed, and the need for more concise classification of material was demonstrated. It revealed the need for a broader application of teamwork with the integration of nonprofessionals into the evaluation procedure. It illustrated the need for more group work and sharing of ideas. Everyone was aware of the need for more services.

In conclusion, the physical therapy group would like to emphasize to all therapists and ancillary personnel in order to equip the adult with cerebral palsy to take his rightful place in society, there must be understanding of the value of each group's contribution and all must be able to work together.

For the Conference:

Consultant:

William Brooks, Coordinator, Godmothers' League, Cerebral Palsy Center, New York City.

Group leader:

Mary Callahan, Director of Training Courses, Physical Therapy, Columbia University, New York City.

Recorder:

Jacob S. Schleichkorn, Richmond County Cerebral Palsy Treatment Center, Staten Island, New York.

Members of the Physical Therapy group included:

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May Deigman, N. Y. State Department Social Welfare.
Mrs. Shirley Edelstein, Department of Health, Cerebral Palsy Classes, P.S. 85, Bronx, N. Y.
Anne Franklin, Long Island College Cerebral Palsy Clinic, New York City.
Alex Geller, Long Island College Cerebral Palsy Clinic, New York City.
Kate Painter, Parents Cerebral Palsy Unit, Akron, Ohio.
Iva Valler, Newton Memorial Hospital, Newton, N. J.
John Wheaton, Passaic County Elks Cerebral Palsy Treatment Center, Clifton, New Jersey.

The Physical Therapy group congratulates the administrators of the conference, Mr. Ernest Fleischer, State University of New York; Dr. Maurice Fouracre, Teachers College, Columbia University; Dr. Herbert Rusalem, Federation of the Handicapped, for their efforts in developing the conference and assistance with this report.

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Retraining the Elderly Hemiplegic. Marjory W. Warren, Geriatrics, 8:198-203, April 1953.

Rehabilitation in Malum Coxae Sinilis. Farkas Aladar, Geriatrics, 8:204-214, April 1953.

Meet Our New Contributors

William H. Brooks, Coordinator, Physical Therapy, Godmothers' League, Cerebral Palsy Rehabilitation Center, New York City, attended Springfield College in Massachusetts before matriculating at New York University where he received his B.S. degree. He completed requirements in physical therapy at the University's School of Education, and at present is studying for his master's degree.

For five years Mr. Brooks was Director of Health and Physical Education, YMCA, Brooklyn, and for two years was Group Worker and Community Center Director for the New York City Board of Education. Prior to accepting his present position, Mr. Brooks was physical therapist at the Nassau County Diagnositic Treatment Center for Cerebral Palsy. He is a member of the American Physical Therapy Association and the Association for Health, Physical Education and Recreation.

Mary E. Callahan, Director of Training in Physical Therapy, College of Physicians and Surgeons, Columbia University, New York City, received her nursing preparation at Clinton Hospital in Massachusetts and her physical therapy training at Possé Institute in Boston, where she was awarded a certificate in 1940. Miss Callahan has a B.S. degree from New York University and is completing requirements for her master's degree at Columbia University.

(Continued on page 446)

Editorials

When a child is born it is reasonable to think of his future in terms of four large periods of growth which we call infancy, childhood, adolescence, and maturity. Each phase is separate and definable and yet each grows inexorably out of the one before. No one part of a life is ever unrelated or divisible from another and each affects the content and achievement of every following circumstance. So well known are these areas of growth and development that behavior can be predicted and adjustment analyzed minutely in light of past experience. Perhaps of greatest importance is the fact that we know the limits of these ages and also the responsibilities that each carries with it.

A rather interesting parallel to this pattern exists for us in the development of our own profession over the past thirty-odd years, and the thought occurred that an analysis of this growth might carry with it a clearer understanding of our past, our present and, most important, our future.

Considering first the years between 1920 and 1930, we can see in retrospect that this was the era of beginning. Here was the time of imagination, enthusiasm and far-sighted planning that laid the foundations and set the pattern for the present. Certainly this must have been a time of trial and error since the precedents were few or nonexistent and the infant association had to move forward on its own. Here, too, was the era of internal growth and stabilization still on a small scale and with horizons near at hand and limited.

The second decade, the "30's," was perhaps the most important since this was the time when, with initial enthusiasm over, there was a period of unexciting, deliberate work aimed chiefly at strengthening and expanding the framework. In any association, this period of "second growth" is always significant in that there is the potential danger of retrogression or the tendency to hold to the established patterns and fail to seek growth. We should be grateful to our members who, during this era, remained farsighted and enthusiastic and succeeded in providing a sound pattern for development.

The 1940's were surprisingly and memorably a period of real adolescence. The characteristics of rapid growth, sudden responsibility and quick and serious maturity were all present and each has left its mark on the organization. Perhaps it was during this period that the true value of the sound foundation was recognized, for even during what might be called an "emergency era," the basic soundness of policy continued.

We are now into the decade of the '50's and this well may be time to evaluate our position. Certainly we can detect the signs and symptoms of maturity and just as certainly we must accept the responsibilities which present themselves. We who are now an integral part of this group must do more than appreciate what has gone before and realize our debt to the interest, work, and intelligent planning of our predecessors. Ours is the great responsibility of progress based on stability and service. From this point onward the contributions of each member in both small services and large will continue to be of greater importance and will, if properly accomplished, result in gainful rewards.

Association Activities

National Office Reports . . . . . .

Field Program

DOROTHY HEWITT, *Educational Consultant*

Ten schools were visited and twenty-eight training facilities.

Schools	Clinical Affiliates
Cleveland Clinic	1
University of Connecticut	5
University of Wisconsin	2
University of Michigan	3
University of Buffalo	5
Columbia University	5
Washington University	3
St. Louis University	1
Albany Hospital	1
Medical College of Virginia	3

In addition three schools were visited which are considering a physical therapy curriculum.

Western Reserve University	3
Marquette University	4
University of Maryland	1

The Educational Consultant attended two regional meetings of the Directors of the Approved Schools; the National Personnel and Guidance Association; the Congress on Medical Education and Licensure; meetings of Volunteer and Governmental Agencies on personnel shortages.

Special Committees

During the year the Consultant was actively concerned with two special projects, the Revision of the Essentials and the Preparation of Test Items for licensing examinations. The Committees with whom the Consultant worked were.

Advisory Committee to the Educational Consultant
Essentials Committee
Regional Committees of Physical Therapy Directors
School Section
Advisory Committee to the Examination Program
Committee on Education
Recruitment Steering Committee

Professional Services

LUCY BLAIR RUTH WHITTEMORE

Report of this division appears in a separate addendum.

Chapter and Membership Services

MARY HASKELL, *Associate Executive Director*

Fifteen chapters were visited. At the same time clinical visits were made in each area.

Alabama, Indiana and Northern Indiana (joint meeting)
Kansas
Louisiana (Executive Committee)
Michigan (Eastern and Western Districts)
Mississippi
Missouri (Eastern and Western joint meeting)
New York (Chapter and Executive Committee)
Greater New York District (Executive Committee)
Pennsylvania, Western Pennsylvania (Executive Committee)
Rhode Island
Texas
Wisconsin (Executive Committee)

Chapters visited by other staff members:

Arkansas (L. B.)
Connecticut (M.E.)
District of Columbia (M.E.)
Florida (M.E.)
Illinois (M.E., D.H., & M. Hyer)
Puerto Rico (M.E.)
Massachusetts (M.E.)

Meetings:

American Hospital Association (Exhibit in Philadelphia)
Association of Military Surgeons (panel participant in Washington)
Defense Advisory Committee on Women in the Services, New York.

MILDRED ELSON, *Executive Director*

Regional, National and International meetings:

First National Congress on Rehabilitation of Haiti
Non-Governmental Organization Conference on Rehabilitation, United Nations
American Association of Medical Record Librarians, Annual Convention
Congress of Physical Medicine and Rehabilitation
National Health Council
Ad Hoc Committee, National Institute of Health
Mid-western Regional Meeting of School Directors
National Rehabilitation Association Workshop.

Professional Services
May 1, 1952 to April 30, 1953

A. An all time high has been reached in the Placement Service which has been developed for the convenience of our members.

716 facilities have requested assistance in locating physical therapists on a permanent basis.

222 requests have been closed following a written report that the facility had met the need.

75 incomplete requests have been closed following initial correspondence.

43 of these facilities have placed classified advertisements in the *Physical Therapy Review*.

378 facilities were active in the Placement Service at the end of the fiscal year.

57 of these facilities have placed advertisements in the *Physical Therapy Review*.

43 requests were reopened during the year.

41 requests are pending additional information before active service can be assured.

190 American Physical Therapy Association members have had the assistance of our Placement Service in locating positions.

115 American Physical Therapy Association members have been removed from Placement Service following a written report that their placement needs have been met.

6 American Physical Therapy Association members were removed and reactivated upon request during the fiscal year.

75 American Physical Therapy Association members are receiving the active assistance of the Placement Service at the end of the fiscal year.

B. The year 1952 proved to be a serious polio epidemic year, with 57,628 reported cases. The Polio Assignment Service located and assigned physical therapists for temporary duty with 76 hospitals or agencies in 61 cities of 28 states.

6 physical therapists were on temporary polio assignments on May 1, 1952.

136 assignments of physical therapists for polio emergency service in 28 states and Alaska were made.

139 physical therapists have completed their temporary assignments.

3 physical therapists had not completed their temporary polio assignments on April 30, 1953.

196 physical therapists were requested to assist in the polio epidemic period of 1952.

52 facilities requesting a total of 60 physical therapists could not be honored through the Polio Assignment Service, but alternate plans for meeting the local needs were suggested and accepted.

38 physical therapists, who were sent to an epidemic area through the Polio Assignment Service, accepted permanent positions in the same area following the termination of their temporary assignment.

C. The Consultants responsible for the activities in the Division of Professional Services have attended Chapter and Chapter Executive Committees when visiting the several states and have served as ex-officio members of working committees of the National Association. They have met with representatives of the National Foundation for Infantile Paralysis in establishing procedures to be used in the use of physical therapists during polio emergency periods and under Epidemic Aid Grants. They represented the American Physical Therapy Association at hospital and public health association conventions and served on a committee concerned with standards for the hospital care of orthopedically handicapped children.

D. Advisory or consultation visits have been made to 22 states in which 162 hospitals and agencies in 63 cities were served.

States	Cities	Facilities
Alabama	2	6
Arkansas	1	2
Connecticut	1	6
Georgia	1	1
Illinois	4	9
Iowa	6	17
Kansas	3	10
Kentucky	2	10
Louisiana	4	5
Michigan	2	3
Minnesota	2	2
Mississippi	2	6
Missouri	4	14
Nebraska	2	9
New Jersey	1	1
Ohio	4	9
Oklahoma	2	7
Tennessee	2	6
Texas	8	27
Virginia	1	1
West Virginia	4	4
Wisconsin	5	7
Total — 22 States	63	162

Recruitment and Informational Material Sent
May 1, 1952 to April 30, 1953

Individual requests for one or more pieces of literature totaled: 3,968

Material sent to:

High School Students	847
College Students	339
Institutions, Libraries and Counselors	1,232
Other	1,093

Bulk mailings totaled 120,359 pieces of literature.

1952-53 Membership Report

New members:

Active	567*	
Associate	1	
Honorary	1	
Life	5	
		574

* Includes 66 who were not recent graduates and 13 who were foreign trained.

Reinstatements:

Active	35	
Inactive	10	
		45

Resignations:

Active	32	
Inactive	19	
		51

Deceased:

Active	4	
Inactive	1	
		5

Dropped for nonpayment of dues:

Active	49	
Inactive	27	
		76

Total Membership, May 1, 1953:

Active	4,279	
Inactive	977	
Associate	47	
Honorary	10	
Life	15	
		5,328
Student Members:		671

Total Membership, May 1, 1952:

Active	3,960	
Inactive	819	
Associate	47	
Honorary	9	
Life	10	
		4,845
Student Members:		546

Net gain in membership (not including student members): 433

The following members passed away during the year 1952-53:

Florence Case
Mildred Edwards
Edith Goldsmith
Hazel Hoak
Beatrice Sandhoff

Five applications for membership were rejected during the year 1952-53:

Foreign trained physical therapists:

Number of applications received	9
Number now on probation	8

ANNUAL REPORT
Physical Therapy Review

Circulation	1952	1953	Increase
	5,700	6,251	551

The *Review* goes to the following forty-three countries:

Arabia	1
Argentina	2
Australia	40
Austria	6
Belgium	12
Bermuda	1
Brazil	7
Br. West Indies	2
Canada	42
China	1
Columbia	2
Cuba	7
Czechoslovakia	1
Denmark	18
Dominican Republic	1
England	15
Finland	2
France	8
Germany	5
Haiti	1
Holland	8
Honduras	1
India	8
Israel	11
Italy	6
Japan	3
Korea	1
Liberia	1
Mexico	6
New Zealand	3
Norway	20
Pakistan	1
Peru	2
Phillipine Islands	1
Portugal	1
Scotland	1
Sweden	12
Switzerland	10
Union of So. Africa	9
U. S. S. R.	4
Uruguay	4
Venzuela	2
Wales	1
Total	290
Increase	37

We have 976 non-member subscriptions of which 292 were added during the year..

There were 206 abstracts in the *Review* and 94 reviews of books, of which 51 were written by members of the Association.

Three of the books reviewed were written by physical therapists—members of the Association.

Advertising

Classified

1951-52	1952-53	
102	157	Increase of 55

Space Advertising

New Advertisers — Seven
- American Restorator
- Edison Chemical Co.
- Hanovia Manufacturing Co.
- Medco Products
- Physical Therapy Equipment
- Poor and Logan
- Saunders Publishing Co.

There were two special issues of the *Physical Therapy Review* — 1952-53:

The Polio Issue — July 1952
The Education Issue — April 1953

Dallas Conference Surpasses All Promises and Predictions

According to reliable sources (all physical therapists who were in Dallas June 14-20, 1953) it was a real success. Texas promised in 1951 and Texas came through in 1953. We regret that many of you were not sufficiently prepared for the cold climate of the Baker Hotel, but that is our only regret.

Texas hospitality was only equalled by Texas efficiency. The 478 members and 50 guests motivated the best in everyone. The House of Delegates came into its own, there were more members on the program, and it was a "Giant" conference. There were guests from England, New Zealand, and India, as well as our own members from Puerto Rico, the Virgin Islands, 43 states, and the District of Columbia.

The social events were fun and everyone was made welcome. Exhibits both technical and scientific were instructional and well attended. Awards for chapter entries will be announced next month.

There were more members present from Texas than any other chapter (almost 80 per cent of their membership), but, of course, some of them only had to travel 300 miles round trip.

Other chapter honors go to:

Alabama	65%
Arkansas	41%
Mississippi	40%
New Mexico	54%
Oklahoma	38%

Read the reports in the September Review and watch for the revealing Candid Conference Camera.

Registration Law in Wisconsin

On July 3, 1953, Wisconsin became the 18th state to provide legal recognition of physical therapy when Governor Kohler signed a bill to register physical therapists in that state. This is a mandatory law which provides that no person shall practice or hold himself out as authorized to practice physical therapy without a certificate of registration issued by the board of medical examiners and he practices under the prescription and supervision of a person licensed to practice medicine and surgery.

Applicants for registration must be at least 20 years of age and graduated from a school of physical therapy with standards of education substantially equivalent to those of the University of Wisconsin. Examination is given by a state examining committee for physical therapy composed of the physical therapists working under the board of medical examiners. Fee for registration is $15.00. Reciprocity is provided for those licensed in states with equivalent standards and the fee is $10.00. Permits to practice temporarily (not to exceed 6 months) to assist in a medical emergency will be issued without examination for $2.00. Certificates must be renewed annually on February 1st of each year at a $3.00 renewal fee.

Membership Requirements Made Retroactive

At their annual meeting in Dallas in June, the Executive Committee voted to make the present membership requirements retroactive. This means that any physical therapist who has graduated from a school of physical therapy approved by the American Physical Therapy Association from 1928 to 1936, or by the Council on Medical Education and Hospitals of the American Medical Association since 1936 may become a member upon application, verification of graduation, and payment of current dues.

Professional Income Replacement Program Approved

Following several months investigation a plan to provide active members of the Association with professional income replacement in the event of disability from accident or sickness was presented to the Executive Committee and House of Delegates at the annual meeting in Dallas. The Executive Committee approved and the House of Delegates endorsed a proposal made by the Mutual Benefit Health and Accident Association of Omaha which will be available to all active members of the Association under age 70. No financial gain or obligation is assumed by the Association but mmbers who wish to enroll will benefit from the economy of group administration and wholesale buying power in premium rates which are from 30 to 50 per cent less than comparable individual coverage.

The plan approved offers lifetime benefits in the event of accidental bodily injury and two years benefits for disability from sickness or disease.

In the near future every active member will receive information from Mutual of Omaha regarding enrollment. At the end of a two-month enrollment period, the program will be made effective for all active members whose applications are acceptable to the underwriters. When 50 per cent or more members enroll in the program, the insurance will be available to all applicants regardless of health history. Members who have questions regarding the plan are urged to write them to the National Office. We welcome this opportunity to provide another form of service to our members.

Coming Meetings

The American Occupational Therapy Association will hold its Thirty-Sixth Annual Conference, November 13 to 20, 1953, at the Shamrock Hotel, Houston, Texas.

Courtesy of the British Information Services

ST. PAUL'S CATHEDRAL

ST. PAUL'S CATHEDRAL was built after the Great Fire of 1666 by Wren on the site of Old St. Paul's. Members attending the First International Congress of the World Confederation for Physical Therapy have been invited to attend services here, Sunday, September 6.

World Confederation for Physical Therapy

Donations to the World Confederation for Physical Therapy have been received from the following chapters since the last listing in the July Review:

Northern California	$50.00
Eastern Missouri	2.00
Nebraska	10.00
Rhode Island	10.00

Marius Smith-Peterson, M.D.

Dr. Marius N. Smith-Petersen died in Boston on June 16 of a heart ailment. Dr. Smith-Petersen was, of course, particularly well known through his development of several orthopedic surgical technics. He was a consultant at Massachusetts General Hospital and retired professor of orthopedic surgery at Harvard Medical School.

A native of Grimstad, Norway, he came to this country in 1903, received a bachelor of science degree from the University of Wisconsin and graduated from Harvard Medical School in 1917. He served overseas in World War I as a surgeon in the Harvard unit of the American Ambulance Hospital.

Dr. Smith-Petersen was a member of the International Society of Surgery, American Academy of Orthopedic Surgeons, American Orthopedic Association, International Society of Orthopedic Surgeons as well as national and local medical societies.

Membership News

Marriages

Carol Meinhold of Brockport, N. Y., to Dr. Robert G. Steele, Jacksonville, Fla.
Marie Ruth Osgood of Glens Falls, N. Y., to Fletcher E. Gustafson, Glens Falls, N. Y.
Mrs. Frances Bond of Pasadena, Calif., now Mrs. Frances T. Lindemann, Pasadena, Calif.
Anne H. Sommerville of Wilmington, N. C., now Mrs. Anne S. Smith, Wilson, Va.
Elizabeth Smythe of Oakland, Calif., now Mrs. Elizabeth S. Lanchstedt, Oakland, Calif.
Ethyl L. Merritt of Washington, D. C., now Mrs. Ethyl M. Groves, Silver Spring, Md.
Louise Hills of Lexington, Mass., now Mrs. Louise H. Kimball, E. Pepperell, Mass.
Virginia Ericsson of Chicago, Ill., now Mrs. Virginia E. Picken, Sterling, Ill.
Mrs. Ruth L. Ross of Minneapolis, Minn., now Mrs. Ruth L. Walsh, Minneapolis, Minn.
Rosemary Garrett of Washington, D. C., now Mrs. Rosemary G. Hartley, Arlington, Va.
Maxine Stukes of Beaumont, Texas, to Marshall W. Edwards, Beaumont, Texas.
Hilda Toker of Montclair, N. J., now Mrs. Hilda T. Rubin, Montclair, N. J.
Alice Ann Sellers of Chicago, Ill., now Mrs. Alice Ann S. Ochs, Evanston, Ill.

(From left to right)—Dr. Ensio K. F. Ronka, guest speaker, Ruth Hayward, President of the Physical Therapy Club, Beatrice Campbell, Vice-president.

First Annual Banquet of Physical Therapy Club

The first annual banquet of the Physical Therapy Club of Boston University, Sargent College, was held at the Hotel Commander in Cambridge, Massachusetts, March 18, 1953.

The purpose of the banquet was fourfold: to celebrate the twentieth anniversary of the graduating of the first class with physical therapy major students at Sargent and the fifth anniversary of the founding of the Physical Therapy Club; second, to initiate the sophomore students into the club; third, to present the club pin to junior students; and finally, to honor the seniors whose graduation was June 8, 1953.

Ruth Hayward, president of the Physical Therapy Club, presided. George K. Makechnie, dean of the college, and Dr. Kenneth Christophe, medical director of the course, extended greetings to those present. Among the honored guests were: Mrs. Marion Hill Waters, a physical therapy graduate of the class of 1933, Mrs. Jacquelyn Hogan Curtis, first president of the Physical Therapy Club and a graduate of the Class of 1948, and Miss Marilyn Kidder, physical therapy instructor at the University of Connecticut and also a graduate of the Class of 1948. In keeping with the theme of the banquet, which was "Through the Years, 1933 to 1953," Miss Adelaide L. McGarrett, technical director of physical therapy, reviewed the progress of the course from its infancy to its present status and told of proposed plans for future growth. Dr. Ensio K. F. Ronka, lecturer in advanced anatomy at the Boston University School of Medicine, was the guest speaker. He told of the contribution medicine has made in the progress of mankind through the centuries, and pointed out the responsibility of physical therapists, participating as members of the medical service, to world civilization.

The banquet was a memorable occasion. All of the students enrolled for physical therapy at the college had reservations, making a total of 107 students. It is anticipated that a banquet will be planned each spring.

Members who have not paid 1953-1954 membership dues will be removed from the Review mailing list after this issue.

WASHINGTON SQUARE ARCH

New York University

School of Education

Preparation for the "proud profession" has been an integral part of the offerings of the School of Education of New York University for twenty-three years; so we can surely lay claim to the values of ripening age. At the same time, we have managed to retain vigor over the years through participation in a series of graduated exercises aimed to increase our range and strength, especially in the areas of course planning, instruction, and clinical training.

One hundred and thirty students are now registered in our undergraduate and graduate physical therapy curricula, about two thirds of them men. Of that number, fifty students are enrolled for the basic strict specialization program. With growing recognition of physical therapy as a career of human importance and prestige, we are much pleased by the increasing number of young people entering our four-year curriculum immediately upon graduation from secondary school. That is a healthful sign.

Affiliation of the School of Education Physical Therapy Division with the College of Medicine and the Institute of Physical Medicine and Rehabilitation of New York University is close, a considerable number of our specialization courses being conducted at one or the other and taught by members of their medical staffs. The fine, modern Institute building is a source of pride and joy to us all; and with an extensive New York University building program under way, the future holds promise. The Hospital for Joint Diseases likewise provides space, equipment and medical teaching personnel for our program of professional education in physical therapy, a long and pleasant association that has stood the test of time.

For clinical practice we really spread ourselves. Thanks to the able and willing cooperation of thirty hospitals and rehabilitation centers in or near the metropolitan area, each basic training student rotates through six different facilities to obtain a well rounded field experience. We hope we are making friends, if not influencing people.

The heart of a great city does not lend itself well to what is commonly labeled "campus life." Still, with the university owning most of the buildings on Washington Square (atmosphere supplied by the arch, old trees, grass, flowers, fountain, and philosophers playing at stone chess tables), we *feel* that it is ours and love it. Our women students who live in the Judson Residence facing the Square, are especially possessive in attitude not only toward Washington Square, but the whole of Greenwich Village! You know of other allurements Father Knickerbocker offers. As one of our veterans put it, "I hear there's more to this town than Washington Square and the N.Y.U.-Bellevue Medical Center; and believe me, if I ever finish this physical therapy school mission, I'm going to find it."

New Student Members

Boston University

Leona Carney — Diane Doonan
Joan M. Couture — Bargara Ann Goss
Annette O'Gorman

Columbia University

Antoinette Lodato — Steven Maitinsky

University of Connecticut

Regina A. Fogg — Arnold I. Greenberg
Edwin G. Gresczyk

University of Pennsylvania

Grace E. Scruggs

Columbia Offers Postgraduate Course in Cerebral Palsy

A Postgraduate Course in Cerebral Palsy has been announced by the College of Physicians and Surgeons of Columbia University. This course, under the sponsorship of the Coordinating Council for Cerebral Palsy in New York City and United Cerebral Palsy Associations, Inc., will be given for physicians from October 12 through October 23, 1953, and for physical and occupational therapists from October 12 through December 11, 1953.

The Department of Physical Medicine and Rehabilitation with the faculty of its training courses in physical and occupational therapy will be the administrative and teaching nucleus, while important portions of the teaching will be supplied by specialists in other areas from the College of Physicians and Surgeons, by leaders from other institutions in the community, by the staffs of cooperating cerebral palsy centers, and by national leaders in cerebral palsy.

U. S. Public Health Service Report

Number of Cases of Infantile Paralysis Reported, United States

Dates	1953	1952 *comparable period*
Latest Week (Ended June 27, 1953)	538	583
Previous Week (Ended June 20, 1953)	400	420
Calendar Year to Date	4,057	3,556

Statistical Services Department reports:

"The national total of 538 polio cases reported by the U. S. Public Health Service for the week ended June 27, 1953 was 34 per cent larger than the number a week earlier, and represented an increase of one-fourth over the average level for the comparable week of the past five years. The figure for the latest week, however was 8 per cent below the number in the corresponding week of 1952.

"During the current calendar year to date, 4,057 cases have been reported. This total is more than one-third larger than the corresponding cumulative average of the five-year period, 1948-1952, and exceeds by 14 per cent the 3,556 cases reported in the same period of 1952."

The following states have reported significant changes in the number of reported cases as compared with the cumulative number for the corresponding weeks of 1952:

State	*Per cent Change from 1952*
Nevada	+525.0
Alabama	+256.7
Missouri	+200.0
Mississippi	−33.1
Louisiana	−48.4
Texas	−55.6

Recruitment Film Telecast

The recruitment film, "Within Your Hands," was telecast on the ABC-TV television network July 12 from 10:15 to 10:30 p.m., EDST. The film was used as a part of the regular ABC-TV program series called "Focus," which is regularly seen at that time.

The National office has available a special 14½ minute television version of the film which may be borrowed for showing on any television station.

Annual dues were payable on May 1st. Your prompt response will be appreciated.

May we also call to your attention that according to the Bylaws "any active member not actively employed in physical therapy may, on application to the Executive Committee and on approval thereof by the Committee, be made an inactive member."

Schools of Physical Therapy

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS
OF THE AMERICAN MEDICAL ASSOCIATION

Graduates of these schools are eligible for membership in the American Physical Therapy Association.

California

School of Physical Therapy
Childrens Hospital Society
4614 Sunset Blvd., Los Angeles 27
(Univ. of California, Los Angeles)

School of Physical Therapy
College of Medical Evangelists
White Memorial Hospital
Boyle & Michigan Aves.
Los Angeles 33

Department of Physical Therapy
University of Southern California
University Park
Los Angeles 7

Curriculum in Physical Therapy
School of Medicine
University of California
3rd & Parnassus
San Francisco 22

Division of Physical Therapy
Stanford University
Stanford

Colorado

School of Physical Therapy
Department of Medicine
University of Colorado
4200 East Ninth Ave.
Denver 7

Connecticut

School of Physical Therapy
University of Connecticut
Box U 101
Storrs

Illinois

†*School of Physical Therapy
The Medical School, Northwestern University
303 East Chicago Ave.
Chicago 11

Iowa

†Department of Physical Therapy
State University of Iowa
University Hospitals
Iowa City

Kansas

School of Physical Therapy
University of Kansas — Medical Center
Kansas City 3

Louisiana

†Charity Hospital School of Physical Therapy
1532 Tulane Ave.
New Orleans

Massachusetts

*Course in Physical Therapy
Bouve-Boston School
Medford 55
(Tufts College, Medford)

*Program in Physical Therapy
Simmons College
Children's Medical Center
300 Longwood Ave.
Boston 15

*Department of Physical Therapy
Boston University
Sargent College of Physical Education
6 Everett St.
Cambridge 38

Michigan

Curriculum in Physical Therapy
Dept. of Physical Medicine & Rehabilitation
University Hospital
University of Michigan
1313 East Ann St.
Ann Arbor

Minnesota

Course in Physical Medicine
The Medical School
University of Minnesota
Minneapolis 14

†School of Physical Therapy
Mayo Clinic
Rochester

Missouri

Department of Physical Therapy
Division of Auxiliary Medical Services
School of Medicine
Washington University
Barnes Hospital
600 S. Kingshighway
St. Louis 10

Division of Health & Hospital Services
St. Louis University School of Nursing
1402 South Grand Blvd.
St. Louis 4

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* Only women accepted
† Only certificate awarded.

New York

*Physical Therapy School
Albany Hospital
New Scotland Ave.
Albany 1
(Russell Sage College, Troy)

Program in Physical Therapy
University of Buffalo
2183 Main St.
Buffalo 14

Division of Physical Therapy
College of Physicians & Surgeons
Columbia University
630 W. 168th St.
New York 32

Curriculum in Physical Therapy
School of Education
New York University
Washington Square
New York 3

North Carolina

†Division of Physical Therapy
School of Medicine
Duke University
Durham

Ohio

School of Physical Therapy
The Frank E. Bunts Educational Institute
Euclid & East 93rd St.
Cleveland 6
(Cleveland Clinic)

Pennsylvania

†The D. T. Watson School of Physiatrics
Leetsdale

Division of Physical Therapy
School of Auxiliary Medical Services
University of Pennsylvania
1818 Lombard St.
Philadelphia 46

Texas

†Grady Vaughn School of Physical Therapy
Baylor University Hospital
Dallas 1

†School of Physical Therapy
Hermann Hospital
Houston 5

School of Physical Therapy
The University of Texas — Medical Branch
Galveston

Virginia

Physical Therapy School
Baruch Center of Phys. Med. & Rehabilitation
Medical College of Virginia
Richmond 19
(Richmond Professional Institute)

Wisconsin

Section in Physical Medicine
Medical School
University of Wisconsin
Madison

U. S. Army Medical Service

†* Physical Therapy Course

Medical Field Service School
Brooke Army Medical Center
Fort Sam Houston, Texas and
Brooke, Letterman, and Walter
Reed Army Hospitals

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Our Book Reviewers for August

Nila Kirkpatrick Covalt, M.D., Chief of Physical Medicine and Rehabilitation, State Commission on the Chronically Ill, Aged, and Infirm, State Veterans Home and Hospital, Rocky Hill, Connecticut.

Harriet E. Gillette, M.D., Consultant in Cerebral Palsy, Florida Crippled Children's Commission; Consultant, Cerebral Palsy and Physical Medicine, Georgia State Department Public Health, Crippled Children's Division; Consultant, Physical Medicine and Rehabilitation, Georgia State Department of Education, Atlanta.

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Eleanor M. Larsen, Ph.D., Instructor in Physiology, Department of Physiology, University of Wisconsin Medical School, Madison.

Janet A. Wessel, Ph.D., Assistant Professor, Department of Physical Education for Women, University of Maryland, College Park, Maryland.

Abstracts

Experiences with the Muscle-Transplant Operation for the Relief of Painful Arthritis of the Hip

Marvin H. Meyers, M.D., J. BONE & JOINT SURG., 35A:384-386, April 1953

Relief of painful arthritis of the hip has posed a difficult medical problem. Conservative measures have proved unsuccessful and alleviation of pain has been sought through surgical intervention. In 1946 Venable and Stuck reasoned that, since this condition was presumably of ischemic origin and satisfactory increase in blood supply to the femoral head had been produced in animal experimentation, a muscle flap transplant might be effective in relieving the pain of monarticular arthritis in humans. In their operative procedure the capsule of the hip was opened and a flap from the medial half of the vastus lateralis muscle was transplanted into a slot one by four centimeters cut in the neck of the femur. They reported rapid relief of pain and improvement in function in 26 out of 27 patients with lasting results for as long as two years.

On the basis of this report a small series of cases with painful degenerative arthritis were selected from the Orthopedic Service of the Out-Patient Department of the Los Angeles County General Hospital to test the procedure. Sixteen operations were performed on 15 patients, 7 men and 8 women, ranging in age from 20 to 75 years, with an average age of about 50. Several surgeons were involved which produced minor deviations from the described operative procedures. All patients, with one exception, have been followed for one year or longer and nine patients have been followed for more than two years. The results of the surgical procedure were considered poor. Most patients experienced no relief of pain after surgery or relief for only 4 to 8 weeks. Four of the patients expressed satisfaction with the operation but were still experiencing some pain.

The author is unable to explain the relief of pain that follows the operation but feels that it is physiologically unsound to expect that an increase in blood supply could bring about the reconstruction of a deformed head of the femur or of degenerated cartilage, and that the more plausible explanation is due to the rest before and after surgery. He does not believe that this type of muscle transplantation warrants consideration in the future in planning the surgical relief of painful osteoarthritis of the hip.

Hip Fractures. The Role of Muscle Contraction or Intrinsic Forces in the Causation of Fractures of the Femoral Neck.

L. D. Smith, J. BONE & JOINT SURG., 35A:367-383, April 1953

Histories of patients who have suffered fractures of the femoral neck of the hip reveal that there are three constants associated with this condition: 1) the orthostatic position of the patient just before injury, 2) inability of the patient to move the leg after injury, and 3) external rotation of the affected leg. These fractures are associated with sudden muscle violence on a hurried effort of movement and not due to falling or trauma. Roentgenograms of the hip show a transverse or transverse oblique fracture of the femoral neck with the lesser trochanter prominent and the distal fragment displaced upward.

It was postulated that it should be possible to produce similar fractures in human femora subjected to similar forces in the laboratory. A series of experiments were conducted and 115 human femoral necks and hip joints were subjected to pressures and to impacts to learn why or how they were broken through the visitation of external violence. In the first experiments a power press was used and gradually increasing pressures were applied to the femurs in various positions. Starting from zero the pressures were increased until fracture occurred and these were recorded. It was found that it required a much greater downward force representing an extrinsic stress to produce fracture than when a force was applied to the femoral neck simulating the torque resulting from contraction of the external rotators which produce an anterior bending movement upon the femoral neck. The results were 1,994.2 pounds and 900 pounds respectively. Experiment II was set up using sudden blows or impacts instead of pressures. Fracture was produced with much less force than that required for pressures, 290.2 foot pounds and 37 foot pounds respectively.

Careful scrutiny of the structure of the pelvis reveals that the small horizontal diameter, the area of lessened density or Ward's triangle in the central neck, and the rudimentary trabecular system in the horizontal plane all serve to make the neck vulnerable to fracture from stresses in the horizontal plane. The neck of the femur extends laterally from the pelvis in the frontal plane and provides a lever to which the external rotator muscles are attached. The femur offers no resistance to rotation when the limb is free, thus there is no great need for structural strength. However, in the orthostatic position with the foot anchored to the floor by the weight of the body the thigh cannot rotate. Contraction of the rotator muscles with the extremity fixed acts like the tightening of a bowstring — the femoral neck being the bow. Thus muscle contraction causes a forward bending movement across the neck at its weakest or horizontal plane and if its strength is exceeded it will break transversely or obliquely.

The author describes a satisfactory method of manual reduction for this type of hip fracture.

The Blood Supply of the Flexor and Extensor Tendons of the Fingers in Man

J. G. Brockis, J. BONE & JOINT SURG., 35:131-138, February 1953.

This paper deals with the normal blood supply of the tendon and tendon sheaths in man. The material studied included 50 fingers and several whole hands from humans. After the arteries, veins and capillaries were filled with collodial silver iodide, the material was dissected, fixed in 10 per cent formalin, developed photographically, and then cleared in oil of wintergreen.

The blood supply of the flexor and extensor tendons of the fingers is described in detail. It was observed that in nonsynovial regions, such as the distal part of the palm and forearm where the flexor tendons have no tendon sheath but lie in loose connective tissue, blood vessels reach the tendon in different ways in different parts. The simplest arrangement is the vessels pass the tendon arranged in curves so that when the tendon moves the curves are straightened out.

In the region of the musculotendinous junction there are numerous feeding vessels which in some instances divide into two — one branch passing into the muscle and the other into the tendon. Other vessels pass directly from the muscle belly into the tendon.

Where the tendon lies within a synovial sheath the supplying blood vessels follow definite patterns which are discussed in detail in connection with individual muscles. Vessels within the tendon lie in the intrafascicular connective tissue which binds the collagen bundles together. These bundles of fibers appear to be the vascular unit around which the blood vessels are arranged; arteries, veins and capillaries are all to be found in intrafascicular connective tissue but no blood vessels are demonstrable inside individual collagen bundles.

The blood-vascular system consists of main feeding channels which supply a longitudinal network of vessels which lie in the intrafascicular connective tissue. A description is given of the variation of typical intratendinous vascular patterns in relation to the proximal interphalangeal joint.

Bodily State in Injuries of the Spinal Cord

Herman Chor, Isadore Finkelman, and Herman Bluestein: NEUROLOGY 3: 111-118, February 1953.

In spinal cord injuries attention has been paid to the well known resultant disturbances of motion, sensation, reflexes, bowel and bladder control, and atrophic state. The authors feel deserved recognition should be accorded alterations in other important bodily functions such as cardiovascular regulation, glucose and water metabolism, temperature regulation and gastrointestinal activity. The regulation of these bodily functions is by way of the autonomic system, many via the spinal cord.

In 353 patients with spinal cord injuries the basal blood pressure was found to be low in the cervical cord lesions, with orthostatic hypertension and the tendency to "black out" in the erect position. Glucose tolerance curves were abnormal although no evidence of liver, pancreas, adrenals or thyroid disease was found. This could be due to the failure of inhibitory or excitatory impulses reaching the peripheral autonomic nervous system.

There was defect in concentration of urine as well as day-night ratio, in the absence of kidney disease. Polydypsia (abnormal thirst) was found in patients with lesions above T9. Diabetes insipidus was found in lesions of the cervical and upper dorsal segments.

Excessive hunger, stasis of the colon, and diarrhea were other findings.

In eleven cases, autopsy pathological findings were found in a wide variety of organs. Mean terminal weight loss was 31.5 pounds.

The authors feel that many other factors contribute to the usual "uremia" given as cause of death. More attention should be given to the general bodily status of these patients, their nutritional state, reaction to surgery, and organs of defense.

Stab Wounds of the Spinal Cord

James R. St. John and Carl W. Rand, Bull. LOS ANGELES NEURO. SOC., 18:1-24, March 1953.

Nine cases of stab wounds of the spinal cord are presented in addition to seven instances reported by Rand in 1929, maintaining the original interest in this rather unusual type of injury. Such wounds are afflicted by a sharp pointed instrument and in the majority of cases the cervical and upper thoracic cord is damaged. It is easier for the blade to slip between the laminae of the cervical region than the thoracic where the laminae tend to overlap and the spine cannot be flexed as easily. Degree of damage varies according to the level of injury, character of the instrument used, and the force of the blow. It has been a significant finding that as improvement takes place almost all cases finally resolve themselves into a variant of the classical Brown-Sequard syndrome.

In four of the nine cases presented increased sensitivity to touch or pain including the entire ipsilateral side of the body was present below the level of the lesion. An example of complete transection of the spinal cord with survival for six months is reported with photomicrographs of this case showing evidence of degeneration of sensory above and motor tracts below the level of the injury. In one case the lesion of the spinal cord did not correspond to the side of the stab wound. It is believed by the present writer that in this instance the knife entered the canal on the left side in a sufficiently oblique direction to pierce the right side of the spinal cord.

In general management of stab wounds of the spinal cord, all foreign bodies and endriven bone fragments should be removed early to relieve pressure on the already damaged cord and to prevent later sequella such as adhesions, abscess formation on iron incrustation. Surgically little if anything can be done to correct bruising or laceration of the cord. Antibiotics and chemotherapy should be employed in all cases whether or not surgery is performed and repeated neurological examinations done because of the generally changing clinical picture.

Electromyography as an Adjunct to Neurological Diagnosis, A Review

A. A. Marinacci, Bull. LOS ANGELES NEURO. SOC., 18:25-39, March 1953.

This report explains the principles of electromyography in application to lower motor neuron disease and is based upon experience derived from examination of about 2,500 cases. The Meditron electromyograph has been used in making all of the recordings in which normal motor units, polyphasic units, fibrillation of denervation and fasciculation action potentials can be heard, seen, photographed, and recorded.

To obtain information the patient is placed on a comfortable table or bed in a well shielded room. The active electrode, inserted into the muscle tissue, is a unipolar insulated needle with only the very tip exposed. The reference electrode is placed adjacent to the active electrode on the skin or subcutaneously if a needle is used. In addition a ground electrode is placed on one of the patient's limbs.

This type of electromyography is based on the breakdown and disintegration of the motor unit potentials as well as the return of motor unit activity during regeneration. Disintegration of motor units results in denervated muscle fibers and fibrillation of denervation appears as the result of axon interruption. Motor units normal or abnormal, are generated only during voluntary efforts. Fibrillation of denervation voltages and fasciculation appear at rest. Electrical silence is present when normal muscle is completely relaxed as well as when the muscle tissue has been replaced by fibrosis. Degenerative motor units and fibrillation of denervation denote lower motor neuron disease.

Electromyography has its greatest value in peripheral nerve injury. The electromyogram will indicate (1) complete interruption of the nerve, (2) partial involvement, (3) reversible physiological block, (4) psychological block, (5) the status

and degree of nerve regeneration. The electromyogram is a laboratory procedure and its findings must be correlated with the clinical picture.

Manipulation of the Spine

Edward G. Ewer, M.D., J. BONE & JOINT SURG., 35A:347-334, April 1953.

The purpose of this paper is to present some generally acceptable methods of manipulation of the spine and to point out the possible dangers connected with its use. Manipulation can be successfully employed for the lumbar, sacroiliac, cervical, and thoracic portions of the spine. The author does not feel that manipulation cures but that its benefits are derived from realignment of altered articulations. The underlying primary causes of distress, i.e., poor body mechanics, congenital defects and abnormalities, arthritic joint changes, neurogenic disease, and muscle imbalance must be alleviated to effect a cure.

He believes that manipulation of the spine is never without danger and that a careful diagnosis should be made before attempting to treat with this modality. If at all feasible the procedures should be carried out on the conscious patient to act as a check. He points out that this type of treatment is primarily to be used on the young and vigorous and that manipulation of the spine in the presence of intraspinal space-consuming lesions and certain other pathological conditions is contraindicated and hazardous. Several safe methods and procedures for various areas of the spine are described and illustrated. Other forms of adjunct therapy are usually prescribed.

The author is of the opinion that manipulation offers dramatic relief in selected cases and can be a useful treatment tool when properly applied.

Vestibular Mechanisms of Facilitation and Inhibition of Cord Reflexes

B. E. Gernandt and C. A. Thulin, AM. J. PHYSIOL., 172:653-660, March 1953.

Afferents which modify the discharge of the centers which give rise to the long propriospinal, vestibulospinal, and reticulospinal tracts reflexly modify posture. Some are facilitatory (vestibulospinal and reticulospinal fibers) and increase muscle tone, others (other reticulospinal fibers) are inhibitory and decrease it. The present work deals with the effect of the downstream impulses as elicited by adequate stimulation of the vestibular organ and transmitted in the vestibulospinal and reticulospinal tracts. The effects on the ventral horn cells are gauged by the monosynaptic method of testing.

The facilitatory effect of the spontaneous impulse discharge in the eighth nerve on oscillographically recorded peripheral nerve to ventral root reflexes has been investigated. The facilitatory action is chiefly transmitted over the reticulospinal tract, and the vestibulospinal tract seems to play a subordinate part.

A facilitatory or inhibitory effect of adequate vestibular stimulation depending on the deflection of the cupula in the ampullae of the horizontal semicircular canals can be demonstrated on the monosynaptic test response, the latter being elicited from the nerve to the anterior tibial muscle or the gastrocnemius nerve. The results show that there is a reciprocal action which may be initiated from the reticular level.

Interaction of Evoked Cortical Potentials

Hsiang-Tung Chang, J. NEUROPHYSIOL., XVI:133-144, March 1953.

The interaction in the sensory cortex of the thalamic, callosal and locally induced cortical impulses has been studied by means of various combinations of paired stimuli at different intervals. It is found that the early positive phase of the callosal potential and the locally evoked cortical dendritic potential are mutually exclusive. The negative component of the callosal potential can be completely inhibited by the dendritic potential and, similarly, the dendritic potential will be completely blocked if the direct cortical stimulation is made during the rising phase of the negative component of callosal response.

The interaction between the thalamic and callosal volleys is characterized by the following phenomena: (1) The first negative component of callosal potential has a blocking effect on the positive component of the primary cortical response to auditory (thalamic) stimulation. (2) The negative component of the cortical response to sound stimulation suffers severe and prolonged inhibition from the callosal potential. The former is believed to be due to the partial involvement of apical dendrites of common neurons in both kinds of potentials, and the latter can be taken as an indication of inhibitory effect from the activity of intracortical internuncial neurons.

The Effect of Denervation on the Regeneration of Skeletal Muscles after Injury

J. H. Saunders and H. A. Sisson, J. BONE & JOINT SURG., 35:113-124, February 1953.

The experiments undertaken in this article were to compare the histological processes and end result of regeneration of completely denervated muscle with the corresponding findings in innervated muscle.

A standard muscle crush in which the whole breadth of the muscle was crushed transversely, producing a band of damage three millimeters wide was done on the gastrocnemious muscles of rats. In each animal the gastrocnemious of one limb was denervated by division of the sciatic nerve in the thigh. One centimeter of nerve was excised to prevent regeneration during the experiment in which rats were killed from 2 hours to 32 weeks after injury and crushed muscles examined histologically. Eighty-six muscles were examined, the normally innervated muscle providing a control for comparison with the denervated one.

It was found that after a crushing injury the fibers of a totally denervated muscle regenerate in the same manner as those of normal muscle. Final effectiveness of muscle repair was found to be the same in denervated tissue as in the normal with comparable intermediate stages. In normal and denervated muscle, findings were consistent with the view that regeneration of muscle fibers takes place from ends of damaged fibers adjacent to the crushed area. The direction and rate of regeneration of individual muscle fibers in normal and denervated muscle depend on the presence or absence of intact sacrolemmal tubes. In these experiments, mitosis of muscle nuclei have not been observed although regenerating fibers contain large numbers of nuclei. In contrast, the surrounding connective tissue contain many mitosis in the days following the injury. The regenerated fibers in normal and denervated

muscle develop conspicuous cross-striation at an early stage in maturation.

Histological findings at periods from 2 hours to 32 weeks are described in detail in the article. Comparisons with findings in normally innervated muscle establishes that the cellular processes of repair do not depend on connections with the central nervous system.

Blood Plasma in Multiple Sclerosis

R. W. Swank, ARCH. NEUROL. AND PSYCHIAT., 69:281, March, 1953.

Purpose of this paper is to demonstrate normal chromatograms and their changes over long periods of time as compared to chromatograms of patients with multiple sclerosis in states of activity and relative inactivity. From 21 normal human subjects 243 chromatograms were made at varying periods ranging from 1 week to 5 months and analyzed for abnormal patterns of plasma proteins. The chromatograms in these cases showed some cyclic activity, the abnormal deviations appearing during complicating "colds" and during the menstrual cycle. Abnormal patterns were obtained from two clinically normal blood relatives of patients with multiple sclerosis; 437 chromatograms were analyzed in the same manner from 41 patients with multiple sclerosis. There were two distinct types of abnormal records. The first type was characterized by very short, and often broad, fractions, and by a decrease in the number of fractions. The second type was poorly organized and contained less than the normal number of protein fractions. Other records showed variations of one or both of these types. The frequency of abnormalities noted was high, tending to recur in cycles every one to three months, and remaining present for one to five weeks. Often the abnormalities in the experimental group occurred more frequently and lasted for shorter periods of time. In all patients with multiple sclerosis normal plasma protein patterns also were frequently seen. In 12 patients the clinical exacerbations of the disease were concurrent with the periods of abnormal chromatograms. More often, however, the abnormal chromatograms were not accompanied by increased clinical manifestations of multiple sclerosis. It is probable that abnormal plasma patterns, though present in all cases of multiple sclerosis, are not sufficient in themselves to cause clinical exacerbations of the disease and thus it seems unlikely that if there is a basic metabolic defect, that it is due to any plasma protein abnormality.

Importance of Negative Pressure Phase in Mechanical Respirators.

J. V. Maloney, Jr., J. O. Elam, S. W. Handford, G. A. Balla, E. W. Eastwood, E. S. Brown, and R. H. Ten Pas: J. A. M. A. 152: No. 3: 212-216, May 16, 1953.

In order to check on clinical subjects results which previously had been reported on dogs, intermittent positive and positive-negative type respirators were studied in both the relatively normal patient and in those with respiratory and/or circulatory inadequacy. Either type respirator was satisfactory in the normal patients — those with essentially normal circulatory status. When respirators were used as a means of artificial respiration in those with respiratory and/or circulatory failure both types gave adequate ventilation, but with positive pressure only, there was a fall in blood pressure and in cardiac output.

With the positive-negative type respirator there was no fall in blood pressure and the cardiac output was maintained at a normal level. In these patients, it was found that intermittent positive pressure may cause depression of blood pressure and cardiac output sufficient to threaten the life of the patient. The results indicate that mechanical respirators with alternate positive-negative pressure and having a mean mask pressure at least as low as atmospheric pressure offer a safe and effective means of artificial respiration without endangering circulation or pulmonary damage.

Normal Wrist Motions

Carl E. Nemethi, INDUS. MED. & SURG. 22: 230, May, 1953.

Range of motion of right and left wrists was measured in 1000 pre-employment applicants, representing a cross-section of average American employees in skilled, semi-skilled and unskilled types of work. The average range was found to be: dorsiflexion — 60 degrees, palmar flexion — 60 degrees, radial flexion — 30 degrees and ulnar flexion — 46 degrees.

The range decreased with age with a loss of approximately 10 degrees for palmar and dorsiflexion, and 3 to 4 degrees in radial and ulnar flexion in age groups from 17 to 50 years. Removal of tension concerning the testing resulted in a greater range. The author concluded that for gross comparisons dorsiflexion and palmar flexion of right and left wrists were equal; and that ulnar flexion was one and one-half times that of radial flexion.

Helps for the Handicapped

Alice B. Morrisey and Muriel E. Zimmerman, AM. J. NURSING 53: 316-318, March, and 454-456, April 1953.

In two concise articles including many illustrations, the authors present a variety of aids to be used by the handicapped. The March issue includes aids to help patients bathe, groom and dress themselves with a variety of devices such as long handled shoe horns, razor holders, stocking pullers and utensils with built up handles. The April issue is devoted to self help aids in moving about, feeding, and carrying out toilet activities, including the use of rocker splint, adapted utensils, "bridgeboard," zipper-back wheel chair. While not new, the material has been culled from many sources and the illustrations would be particularly useful to therapists who must depend on laymen to construct devices for use of patients.

Teaching Infants to Walk: Physiological Considerations

Maurice H. Herzmark. J. PEDIAT. 42: 429-431, April, 1953.

The large number of adults with weak, pronated and painful feet were a handicap in the military services. The author propounds the theory that walking habits are determined by the surface on which the young child learns his initial walking.

Babies who take their first steps on a smooth surface tend to pronate, evert the heels, the heads of the astragali are thrust medially and the weight borne on the long arch. In contrast primitive peoples who walk on uneven surfaces which stim-

ulate the intrinsic muscles of the feet to produce reflex grasping movements have strong feet with no pronation.

Since 1947 the author has been utilizing a specially designed pad with irregular surface to teach children to walk. The results have been encouraging; the development of strong intrinsic muscles of the feet has resulted in well-balanced strong feet with good arches.

Experimental Investigation of the Tissue Reaction to Acrylic Plastics

K. Jansen, E. Henrichsen, and W. Krogh-Poulsen, ACTA ORTHOPAEDICA SCANDINAVICA 22:141-146, Fasc. 2, 1952.

Any plastic material used in bone and joint surgery must be biologically inert, since any reaction would be followed by a chemical osteitis with loosening of the material and failure of the operation. Such material also must be strong, elastic, hard, be easily worked in the desired shape, and must be capable of being sterilized. Several acrylic plastics (methyl-metacrylate) prove suitable for surgery.

The authors have successfully used caps of acrylic made for the femoral head, the head of the mandibula, the radius and humerus. These caps, the clear acrylic rods, rods of acrylic mixed with barium sulphate (to make material radio-opaque) and acrylic cement were tested for tissue reaction on quick-growing young pigs. Forty experiments were made in which the animals were sacrificed two to three months following implantation of the test material into the bone. Autopsy, radiographic, and histological examinations revealed no tissue reaction to the plastic. The acrylic bodies were found to be solidly fixed in the bone tissue. Histological examination showed no sign of osteitis, the bone tissue forming a lamellar wall around the bodies. The results appear to justify further work with acrylic plastics.

Guillain-Barre Syndrome Treated with Corticotropin (ACTH)

Arthur Blood, Wm. Locke and Ralph Carabasi: J. A. M. A. 152: No. 2: 139-140, May 9, 1953.

A case of Guillain-Barre syndrome which improved following administration of ACTH, relapsed on discontinuance of this therapy, and improved on a second course of ACTH, is cited as pointing out the probable role of allergy in this syndrome. Guillain-Barre is an infectious neuronitis with inflammation of multiple nerves, facial diplegia and albuminocytological dissociation of cerebrospinal fluid. The responsible microorganism is not isolated. The authors suggest that it may be a manifestation of hypersensitivity of nervous tissue to allergen and the course may then be influenced by an antiallergic agent.

Bell's Palsy Treated with Cortisone

H. H. Rothendler, AM. J. MED. SCI., 225,4; (358), April, 1953.

Seven case histories are presented to show the response of diagnosed cases of Bell's Palsy to cortisone therapy. In six cases where the therapy was started very early there was complete recovery in less than two weeks. There was no sign of recovery in the seventh case where the drug therapy was not instituted until ten days after the onset of the paralysis.

The etiology of Bell's Palsy is vague, and treatment heretofore has been empirical, treating the effects and not the cause. The rationale for the use of cortisone is to reduce the nonspecific inflammatory and edematous changes that occur about the facial nerve, thus reducing compression on the sheath and restoring nerve function.

Cortisone therapy would have to be begun soon after the onset of the paralysis in order to be effective. It cannot be expected to be beneficial if nerve atrophy has already taken place. A suggested dosage schedule is presented in the paper.

MEET OUR NEW CONTRIBUTORS

(Continued from page 429)

Miss Callahan was physical therapist at Columbia-Presbyterian Hospital and became Coordinator for Columbia-Presbyterian Hospital and the College of Physicians and Surgeons. She was Associate Director of Training Courses in Physical Therapy at Columbia University before accepting her present assignment as Director.

She is a member of the American Physical Therapy Association, the American Registry of Physical Therapists, and the Massachusetts State Nurses Association.

Edgar W. Johnson, Chief Therapist, Department of Physical Medicine, Graylyn Hospital, Bowman Gray School of Medicine, Wake Forest College, Winston-Salem, North Carolina, holds an A.B. degree with a major in physical education from the University of North Carolina. He received his physical therapy training at Duke University, Durham, North Carolina, and was Assistant in Physical Therapy there for four years. He has held his present position since July 1950.

Mr. Johnson is a member of the American Physical Therapy Association, the American Registry of Physical Therapists, and the American Recreation Society.

Lois M. Mitchell, Physical Therapy Consultant, Bureau for Handicapped Children, Department of Public Instruction of Wisconsin, received her basic preparation in physical education at Sargent College and her physical therapy preparation at the Harvard Medical Graduate School. She had experience in physicians' offices and hospital clinics before her service in an orthopedic school. At this time, she is Physical Therapy Consultant for the North-Eastern area of Wisconsin.

Miss Mitchell is a member of the American Physical Therapy Association and the American Registry of Physical Therapists.

Book Reviews . . . . .

A Social Program for Older People. *By Jerome Kaplan, Group Work Consultant for the Hennepin County Welfare Board, Secretary of the Minnesota Commission on Aging. Cloth; price $3.00. Pp. 158. University of Minnesota Press, Minneapolis, Minn., 1953.*

The author's wide interest and experience with our older ("Senior") citizen has made it possible for him to present a practical book that is at once a reference, a text, and a manual of action. The title is a concise statement of subject matter, as to the problems, who is involved, what each one's part is, and how to proceed in providing a social program. There are practical discussions of the senior citizen, his part, place and problems in his current social pattern; the place and required duties of the social group worker and the volunteer in the program. Mr. Kaplan states; "If retirement from gainful employment is necessary, it should be *to* something rather than *from* something"; "Recreation refers to any activity that is both creative and recreative and gives emotional satisfaction to the person involved" and, "If life remains meaningful and positive, the older adult will retain a desire to live in the present and be willing to think about the future, instead of burying himself in the past." With such concepts, group organziation, program planning, group participation are discussed with constructive suggestions and outlines but also with discussions of pitfalls and reasons for failure. Adult camping is outlined as an increasing challenge. The chapter on "The Role of Homes for the Aged" is most timely and the proposed program should be used by everyone concerned with the over 2,000 such homes in this country.

The subject matter is concisely and clearly stated. The 136 pages are easily read, yet contain vast amounts of much needed practical information. Several useful outlines, illustrative materials, bibliographic references, selected readings and a film list are included.

As secretary of the Minnesota Commission on aging, group work consultant for the Hennepin County Welfare Board and a frequent participant in regional and national meetings concerned with problems of the aging, the author has presented the material as an active participant as well as a frequent observer of numerous social programs. With all the necessary and important studies, reports and books now appearing in our literature concerning the problems of our aging population, this book is the most practical one to date since it so well outlines an immediate plan of action that can be instituted and carried out in any community by any interested individual or group.

The Well-Adjusted Personality. *By Phillip Polatin, M.D., Assistant Clinical Professor of Psychiatry, College of Physicians and Surgeons, Columbia University, and Ellen C. Philtine. Cloth; price $3.95. Pp. 226. J. B. Lippincott Company, Philadelphia, Pa., 1952.*

As is indicated by its title, this book is directed toward the general population of intelligent adults, discussing frequent problems in adjustment occurring from college years to retirement. Although the topical content of each chapter is listed in sufficient detail to render easily available the material on any one subject, the volume is not a textbook but is organized for orderly consumption from cover to cover, for chronological progression of common problems in successive phases of life experience: college, work, marriage, parenthood, climacteric, and advanced years. While these are familiar subjects they constitute new experience for the individual.

Recognizing that everyone is perennially trying to orient himself to changing situations, and therefore seeking wider horizons of comprehension in order to evaluate himself and others, the authors present current psychiatric thinking which is instructive, helpful, and reassuring.

It can be read profitably and with interest by those who are not concerned with any pressing problems in order to widen their base of balance when crises do arise, and by those who are beset with specific immediate difficulties. There is psychiatric explanation of the sources and development of personal maladjustment, and suggestions regarding possible solutions if the situation has not progressed beyond the bounds of normal stress to require direct psychiatric attention.

The book is well written and indexed. It is serious and dignified but at the same time stimulates and holds the reader's interest. One reason for this is the very generous sprinkling of pertinent case material which is closely incorporated with the basic psychiatric points. These illustrative histories are especially well presented being concisely to the point yet having a personable and enlivening quality which emphasizes the fact that the authors are discussing the problems of real people for others who are also engaged in living, not just theorizing. This aspect of the book is much like a journey on a city elevated railroad with intimate glimpses into the homes of families living along the way revealing an infinite variety of life's problems and rewards, most of them pertaining to everyone's life in some degree.

An Outline of General Physiology. *By L. V. Heilbrunn, Professor of Zoology in the University of Pennsylvania, Philadelphia. Cloth; price $10.50. Pp. 818; illus. 123. W. B. Saunders Co., Philadelphia, Pa., 1952.*

The subject of *general physiology* is a relatively new science which includes all life, from microscopic organisms to man, seeking insight into the nature and mechanisms of living matter. The author has quite adequately covered the rapidly expanding field in his book entitled: *An Outline of General Physiology*. This revised third edition by an eminent zoologist and physiologist presents an immense amount of factual material which may provide a general background, serve as a reference book, or constitute a refresher course for basic concepts of general physiology. The context and illustrations are amply documented with classical and recent contributions from all branches of physiological knowledge. The numerous figures and tables are simply and carefully presented. The style is scholarly and easy to comprehend, reflecting the attributes of a real teacher throughout the volume.

This would be an excellent text for courses in general or comparative physiology. However, it probably would not be chosen as a textbook in human physiology for physical medicine students, perhaps not selected as an addition to their personal reference library, but considered rather as a reference which might be useful in a physical therapy department library where physical therapists could look up basic physiological knowledge pertinent to their pro-

fessional problems as they arise. The chapters which would be most useful for this purpose include the following subjects: the physicochemical environment of living material, the effects of heat and cold, reactions due to hydrostatic and atmospheric pressure, the effects of light, chemical factors influencing function, the general characteristics of the irritable process, theories of stimulation, theories and types of bioelectrical current, the conductoin of impulses, neuro-muscular reaction, physical and chemical aspects of muscular contraction, the physiological manifestations of advancing age and theories of senescence.

Comroe's Arthritis and Allied Conditions. *By Joseph Lee Hollander, M.D., F.A.C.P., Associate Professor of Medicine and Chief of Division of Rheumatology, Graduate School of Medicine, University of Pennsylvania; Chief of Arthritis Section, University Hospital; and 17 collaborating editors. Fifth edition. Cloth; price $16.00. Pp. 1103, illus. 399. Lea & Febiger, Philadelphia, Pa. 1953.*

A new face has been given an old classic, admirably and skillfully by Dr. Hollander and seventeen equally able co-workers. All are recognized specialists and most either teach or conduct clinics in the war on the rheumatic conditions. This reference book is divided into ten sections covering the classification of the arthritic and rheumatic conditions, the various methods of treatment, and the factors that play a part in the disease. Of special interest to the physical therapist are the following chapters:

Chapter 19—Prevention of Deformities from Arthritis (J. G. Kuhns and T. A. Potter)—The possible etiological relationships between posture and arthritis is discussed in this chapter. Also covered in this section are splinting of affected joints and the use of adhesive, felt, and bandages. Highlighting the chapter are charts which summarize the treatment recommended for arthritis of the various joints of the body and the position of optimum function.

Chapter 20—Correction of Arthritic Deformities (J. G. Kuhns and T. A. Potter)—This chapter is devoted to the role of traction and serial type casts. The authors stress use of pillows and the importance of correct bed positions. Good descriptions of the surgical procedures that may be used on arthritic patients will be of particular interest to the physical therapist. This reviewer was impressed by the lavish use of charts, or to be exact, the small summaries of each section. These charts emphasize the material given in the chapter and can serve as a quick reference for those who treat arthritic patients.

Chapter 21—Physical Therapy in Arthritis (Morris A. Bowie, M.D.)—This chapter starts with a promise and a warning. "Intelligent use of physical therapy is one of the most valuable adjuncts in the management of the arthritic patient." "Injudicious use may cause harm." Dr. Bowie lists the various proven physical therapy procedures and the way in which each one can be used or modified most effectively in the treatment of arthritis.

The sections of the book that deal with painful feet, low back pain, and painful shoulders will be of special interest to the physical therapist. All of the known methods of treatment for these conditions are listed.

This reviewer feels very humble when faced with the task of reviewing effectively such a book. The only way that a physical therapist can appreciate its real value is of course by reading and studying it. It could well be the chief source of reference for every professional person interested in arthritis.

Health Instruction Yearbook 1952. *By Oliver E. Byrd, Ed.D., M.D., F.A.P.H.A., Professor of Health Education, and Director, Department of Hygiene, School of Education, Stanford University. Cloth; price $3.50. Pp. 232. Stanford University Press, Stanford, Calif., 1952.*

Dr. Byrd is the Director of the Department of Hygiene, Stanford University, and professor of education. This is the tenth yearbook of this nature which he has compiled. The compilation was made from 116 different sources and includes 273 articles. Each article selected is presented in brief form. None of the articles has appeared in previous yearbooks and with few exceptions all were published between July 1, 1951, and June 30, 1952.

The book is divided into twenty-one chapters covering such subjects as fatigue and rest, mental health, nutrition, exercise, posture, body mechanics, chronic diseases, drugs, and community health services. A complete bibliography of all articles reviewed by the editor is in the appendix. Probably the most interesting chapters from the standpoint of the readers of the *Review* deal with recent research in the areas of exercise, fatigue, relaxation, and chronic and degenerative disorders.

It is a valuable sourcebook for all workers in health, teachers, nurses, physical therapists, occupational therapists, and others.

A Textbook of Mental Deficiency (Amentia). *By A. F. Tredgold, M.D., F.R.C.P., F.R.S. Ed., Consulting Physician to University College Hospital, London, Assisted by R. F. Tredgold, M.A., M.D., D.P.M., Physician to Department of Psychological Medicine and Lecturer in Medical School of University College Hospital, London. Eighth Edition. Cloth; price $6.50. Pp. 545. Williams & Wilkins Co., Baltimore, Md., 1952.*

For many years Dr. Tredgold's book on mental deficiency has been the standard textbook for all those professional workers interested in this field. The present edition continues and enhances the tradition. The chief merit of the volume lies in its careful description and classification of the various forms of mental retardation and amentia.

The major change over previous editions lies in the chapter on etiology, which has been largely redrafted to include recent work on antenatal pathology such as toxoplasmosis in Rh incompatibility.

The section of legal aspects factor, while of interest to those engaged in formulating programs for the mentally retarded, is hardly applicable to practitioners in the United States.

Mental testing is covered only superficially as are also the subjects of training and employability. It is to be hoped that future editions will remedy these defects to make the volume a truly comprehensive one. Inclusion of a bibliography would render the book of greater use to students who use it as a text.

The book is well indexed and the format good.

This book is a must in the library of any professional worker in the field of mental deficiency.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

Classified WANT-ADS

PHYSICAL THERAPY STAFF of SEVEN must be increased to serve physicians in large southwestern city. Above average salary scale with regular increments. Other liberal personnel policies. Great opportunity for initiative. Outpatient clinic; well equipped, air-conditioned department. In first letter give telephone number. For further information write: Edward A. Snapp, Jr., 3217 Montrose Blvd., Houston, Texas.

WANTED: TWO QUALIFIED PHYSICAL THERAPISTS to work in established department in new 700-bed hospital. Work is supervised by specialist in Physical Medicine and Rehabilitation. Good starting salary, vacation, sick leave and retirement benefits. Write Herman J. Bearzy, M.D., Director of Physical Medicine and Rehabilitation, Miami Valley Hospital, Dayton 9, Ohio.

PHYSICAL THERAPIST: Woman assistant in established public school program. Salary schedule, retirement plan, good working conditions. Ten or twelve months employment as you prefer. Apply to: Assistant Superintendent, Lansing Public Schools, 419 N. Capitol Avenue, Lansing, Michigan.

WANTED: QUALIFIED physical therapist for 50-bed approved children's convalescent hospital. Fully equipped physical therapy department. Variety of cases, both in- and outpatients. Work 5-day week. Salary open. Write Paul C. Benton, M.D., Medical Director and Administrator, Children's Hospital for Convalescents, Box 4014, Tulsa, Oklahoma.

QUALIFIED PHYSICAL THERAPIST wanted for 125-bed polio hospital located in college town of 90,000 population. One year polio experience preferred. Three weeks' paid vacation, good salary plus full maintenance and uniform laundry. Write Edith Vail, Chief Physical Therapist, Central Carolina Convalescent Hospital, Greensboro, N. Car.

WANTED: A QUALIFIED STAFF PHYSICAL THERAPIST (male or female) for new, well equipped department in 200-bed general hospital with outpatient service. Paid vacation and sick leave; 40-hour week. Apply to Bertha H. Field, Physical Therapist, St. Luke's Hospital, Racine, Wisconsin.

WANTED: PHYSICAL THERAPISTS — Children's convalescent hospital, affiliated with Western Reserve University and University Hospitals; 40-hour week; 6 holidays; annual vacation and sick leave with pay. Maintenance optional at low cost. Write for illustrated booklet. Assistant Director, Rainbow Hospital, Cleveland 21, Ohio.

WANTED: 2 STAFF OPENINGS for Chief Physical Therapist and Assistant Therapist. Experience in polio cases desirable. Excellent opportunity in 200-bed hospital. Good starting salaries. Located between Denver and Yellowstone Park. Apply Personnel Director, Memorial Hospital, Casper, Wyoming.

QUALIFIED PHYSICAL THERAPIST (male or female). One now and another in the fall. Either experienced or inexperienced therapist. Rapidly growing Rehabilitation Center, good opportunity for promotion. Salary schedule designed to attract the best. Five-day week, Monday through Friday, 8:30 a.m. to 4:30 p.m. Holidays off, paid vacation and sick leave. Social Security, Workmen's Compensation, Blue Cross and Blue Shield. Contact Roy E. Patton, Executive Director, Crossroads Rehabilitation Center, 3001 North New Jersey Street, Indianapolis 5, Indiana.

PHYSICAL THERAPIST, registered, wanted in 113-bed hospital located near Chicago, Ill. Active department. Excellent salary, vacation and sick leave benefits. Apply Personnel Director, Highland Park Hospital, Highland Park, Illinois.

WANTED: QUALIFIED PHYSICAL THERAPISTS interested in service in the public health field. Opportunity as a junior staff member to work under the guidance of a qualified, experienced senior physical therapist. University study available through local facilities. Good personnel policies. Good salary dependent on experience. Immediate placement. Write to Ruth E. TeLinde, Executive Director, Visiting Nurse Association, 1234 North Prospect Avenue, Milwaukee, Wisconsin.

WANTED: QUALIFIED FEMALE PHYSICAL THERAPIST for work with two orthopedic surgeons in office. Good variety of cases. Write Dr. Jarvis M. Smith, 198 Valley Road, Montclair, N. J.

WANTED: Registered physical therapist for well established outpatient preschool cerebral palsy treatment center. Cerebral palsy training or experience preferred. Forty-hour week. Good salary with annual increases. Five weeks' vacation with pay. For additional information and application write Miss Grace Roberts, Adm. Director, Cerebral Palsy Treatment Center, 553 E. Town St., Columbus, Ohio.

QUALIFIED physical therapist wanted immediately. Work primarily with polio patients; 250-bed general hospital. Excellent salary and benefits with opportunity for advancement. Baptist Hospital, Alexandria, Louisiana.

WANTED: QUALIFIED physical therapist as Assistant to Chief Physical Therapist in 322-bed hospital. Active department includes polio work, rehabilitation and Crippled Children's Clinics. Pleasant working conditions. Permanent opening with complete maintenance, social security, paid sick leave, and vacation and other personnel benefits. For complete details write Mr. F. C. Curran, Director Eastern Maine General Hospital, Bangor, Maine.

(Continued on back cover)

Classified WANT-ADS

WANTED: TWO QUALIFIED PHYSICAL THERAPISTS in 358-bed general hospital; one (1) to develop general physical therapy phase; one (1) to treat polio patients in new, small polio center. Excellent team of doctors and beautiful pool used early and extensively. Excellent salary, living quarters if desired. Friendly hospital. Write Alice Moller, Stanislaus County Hospital, Modesto, California.

WANTED: PHYSICAL THERAPIST, prefer woman, for outpatient dept. university hospital, immediately. Good starting salary with increments. No maintenance except laundry. Vacations, sick leave, retirement all on State Civil Service basis. Educational priviliges; 40-hour week. Apply, Grace E. Shaw, Chief Physical Therapist, U. of M. Hospital, Redwood & Greene, Baltimore, Md., Lex. 9-0320.

An additional vacancy for RESEARCH-MINDED MALE THERAPIST interested in the field of prosthetics. In-service training given prior to laboratory and field testing responsibilities in this area. Must be able to travel extensively. Congenial working conditions and salary commensurate with qualifications and experience. Write to Dr. Sidney Fishman, Project Director, Prosthetic Devices Study, College of Engineering, New York University, 252 7th Ave., New York, N. Y.

WANTED: ASSISTANT PHYSICAL THERAPIST — Female for 336-bed general teaching hospital. Salary varies with expetience. Two weeks vacation and retirement plan. This department treats in- and outpatients both children and adults, and types of cases are diversified. This department is part of a Medical Center located near Syracuse University, which affords excellent opportunity for graduate educational work. Write Martha Lockman, Assistant Administrator, Syracuse Memorial Hospital, 736 Irving Avenue, Syracuse, New York.

WANTED: IMMEDIATELY, one charge and one assistant qualified physical therapists (female), for active, well equipped department in 130-bed general hospital. Excellent starting salary. Please apply to Rev. Sister M. Veronica, Superintendent, St. Joseph's Hospital, Saint John, New Brunswick, Canada.

WANTED: QUALIFIED physical therapist for children's orthopedic hospital, 6 miles from downtown Atlanta, Georgia. Salary commensurate with experience and qualifications. Apply to Director, Scottish Rite Hospital for Crippled Children, Decatur, Ga.

WANTED: PHYSICAL THERAPIST — Modern department in 196-bed hospital. Salary commensurate with qualifications and experience. Opportunity for advancement. Liberal vacation and sick leave benefits. CHILDREN'S HOSPITAL, Elland Avenue, Cincinnati, Ohio.

WANTED: QUALIFIED PHYSICAL THERAPIST for 350-bed general hospital. New, fully equipped department for treating all types of patients. Includes outpatient service. Liberal personnel policies (good salary, forty-hour week, paid vacation and sick leave). Write to: Patricia Martin, P. T., Madison General Hospital, Madison, Wisconsin.

Other want-ads inside cover

Classified WANT-ADS

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